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*Regionalizing Relationalism:*  
Japanese Production Networks in Asia

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Japanese Production Networks in Asia**

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## Introduction

Japan's techno-industrial regime, which I call "relationalism," has proved remarkably resilient in the face of powerful market and political forces for change.<sup>1</sup> Despite a decade of slow or no growth, it continues to be held together by a dense web of longstanding and mutually reinforcing relationships between government and business, between nominally independent firms, and between labor and management.

This is not to say that Japan is immutable. It clearly is undergoing change in the distribution of economic gains and losses, as evidenced by growing income inequality. The "big tent" of relationalism today protects fewer Japanese citizens than it has at any other time in the post-war period. But the tent itself is still standing tall.

Consider some of the following claims made by those who say Japan is undergoing significant structural change, as well as evidence suggesting the contrary:

- The government has implemented regulatory and administrative reforms that appear to diminish its once significant role in private market matters. However, the number of regulations imposed by the Japanese state between 1996 and 1998 was 8.6 percent *higher* than the number imposed between 1986 and 1988, the beginning of a decade of supposed *kisei kanwa* (easing of regulations). And the number of retiring bureaucrats who used the practice of *amakudari* ("descent from heaven") to take up positions in the private sector (often in firms they used to regulate) actually *increased* by 14.4 percent between 1986-88 and 1996-98.<sup>2</sup>
- Horizontal keiretsu ties between firms seem to be unraveling as main banks from different corporate groups merge. At a deeper level, though, one can see that these ties are "re-raveling" as four consolidated keiretsu take the place of the old six. Industry tie-ups, such as the ones between Sumitomo Chemicals and Mitsui Chemicals and between NKK (part of the old Fuyo Group) and Kawasaki Steel (part of the old Dai-ichi Kangyo Group) are following the pattern of bank mergers, such as the ones between Sumitomo Bank and what used to be called Mitsui Bank and between Fuji Bank and Dai-ichi Kangyo Bank.<sup>3</sup>
- In the automobile industry, vertical keiretsu linkages between manufacturing assemblers and their longtime subcontractors appear to be dissolving as foreign firms such as Renault and Daimler Chrysler acquire dominant positions in heavily indebted domestic firms such as Nissan (with an estimated \$21 billion in debt in 1999) and Mitsubishi Motors (\$15 billion in 2000). Cost-cutting managers at these troubled automakers have sought to streamline the system of

parts procurement. On the other hand, competitive automakers such as Toyota and Honda have maintained or even strengthened ties with keiretsu suppliers. For example, in the late 1990s, Toyota increased its equity stake in its three largest suppliers (Denso, Toyota Gosei, and Aishin).<sup>4</sup>

- Japan suddenly seems open to foreign direct investment. Thanks to hefty investments in the automobile industry and financial services sector, foreign capital has indeed increased its position in Japan -- but remains relatively miniscule. In the 1990s, the total flow of FDI into Japan in the 1990s was \$26 billion -- smaller than any other major industrialized country and less than 3 percent the amount of FDI that found its way into the US during that decade.
- Firms appear to be restructuring by trimming payrolls. However, they in fact are achieving such reductions through natural attrition and the transfer of surplus workers to affiliated firms or dedicated subcontractors. For core employees (who are, for the most part, male, middle-aged, and skilled), the job turnover rate remains about 4 percent a year -- not significantly higher than it was in the mid-1980s.<sup>5</sup>

What, then, explains the remarkable durability of Japan's embattled techno-industrial regime? In this chapter, I argue that Japanese government and business elites have rescued — temporarily — the system of relationalism by regionalizing it, by extending its web of relational ties into developing Asia,<sup>6</sup> where such ties still serve a useful economic function. In doing so, however, they have preserved the status quo at home and thereby delayed needed reforms.

This chapter proceeds in six steps: First, I define relationalism more carefully; second, I offer an economic analysis of this techno-industrial regime, demonstrating that its costs began to outweigh its benefits after Japan achieved “catch-up” development; third, I show how Japanese elites sought to extend the shelf life of relationalism by regionalizing it; fourth, I suggest that this process of regionalization was slowed but not stopped by the Asian fiscal crisis of 1997-98; fifth, I assert that the regionalization of relational networks reflects Japanese techno-nationalism, the quest for power or autonomy through control of strategic economic resources; and sixth, I show how regionalization, by rescuing relationalism, has served to restrict the growth potential of the Japanese economy.

## 1. Relationalism

A techno-industrial regime is a) the set of actors (bureaucrats, corporate managers, and labor elites) who generate and utilize knowledge for industrial production in a specific social and spatial context; b) the set of norms that unite and motivate these actors; and c) the set of institutions through which these actors exchange information.<sup>7</sup> When it operates

on the level of the nation-state, a techno-industrial regime is much like what Nelson (1993), Lundvall (1992) and others refer to as a “national system of innovation.”

Although squeezed by globalization and subjected to pressures for convergence, Japan’s techno-industrial regime remains quite unlike the relatively neo-liberal and atomistic regimes found in the United States and the United Kingdom. Relationships matter far more. For example, Japanese government officials still collaborate closely with business executives on industrial policies. In 1998, the Ministry of Economy, Trade, and Industry (METI, better known in the past as MITI) crafted a seven-year plan to aid the satellite industry through a series of joint research projects<sup>8</sup>; in 1999, it joined other ministries in developing a “national strategy” of catching up with the U.S. and Europe in biotechnology<sup>9</sup>; and in 2000, it set up a strategic council to promote the fledgling information technology industry.<sup>10</sup> Furthermore, Japanese corporations continue to maintain longstanding, mutually reinforcing ties with one another via cross shareholding. In a new survey, 719 of 731 major firms reported that they are owned, at least in part, by “stable” shareholders who do not trade such stock. Of those 719 firms, two-thirds indicated that more than 50 percent of their outstanding shares are held in this way. And finally, three-quarters of the firms reported that longtime employees, promoted through the ranks, occupy at least half of the seats on their board of directors.<sup>11</sup>

To an unusual degree, then, Japan’s techno-industrial regime has been – and continues to be -- guided by norms and institutions of cooperation, or what I call “relationalism.”<sup>12</sup> Thus, the Economic Planning Agency of Japan concludes that this system “emphasizes the merits of cooperation based on long-term relationships between economic actors and within economic institutions. In this way, each economic actor has been able to avoid the risks associated with fierce competition, maximizing its self-interest by forging alliances within the market.”<sup>13</sup>

Relationalism in Japan is manifested in three strands of strong, cooperative ties between co-nationals. These are:

- Government-business ties. It is often difficult to distinguish the public from the private sector in Japan, where bureaucrats and business executives routinely confer over policy. Such cooperation often takes the form of “administrative guidance” (gyōsei shidō), an informal policy negotiating process that sometimes is initiated by the state and sometimes by industry.
- Business-business ties. In Japan, as in all market-oriented regimes that recognize private property rights, competition between firms is encouraged -- but only up to a point. “Excess competition,” manifested in bankruptcies and layoffs, is unwelcome. As a result, firms routinely cooperate through a variety of non-market institutions such as trade associations and keiretsu designed to stabilize the market. Keiretsu include a) horizontally organized groups such as Mitsui and Mitsubishi with a main bank, a trading company, and member-firms

- in a variety of different industries, as well as b) vertically organized groups that link the manufacturers of finished goods with parts suppliers and distributors.
- Labor-management ties. Because they invest so heavily in on-the-job training, large companies in Japan rarely resort to lay-offs. Instead, they encourage employees to stay on the job by offering seniority-based wages, as well as private pension funds and other company-specific benefits. Longtime (if not “lifetime”) employees organize themselves into enterprise unions that serve to align the interests of workers and the interests of the company

To be sure, cooperative ties provide the internal “wiring” for virtually all social systems, including a techno-industrial regime. These ties, however, are far stronger, far more durable in Japan, which is why Sakakibara refers to it as a “non-capitalist market economy.”<sup>14</sup> Indeed, strong ties of cooperation have been routinized, and thus institutionalized, in many other areas of the Japanese political economy, including some areas that are critical for technological development. For example, manufacturers in Japan do not usually recruit and hire young engineers directly from the nation’s leading technical schools. Instead, they negotiate with the students’ faculty advisors, who have insisted on adherence to an informally administered allocation scheme for each industry. This linkage between industry and academia has helped maintain a rough parity in skill levels between otherwise competing manufacturers, and has thus reinforced business-business cooperation.

## **2. Development and Relationalism**

Relationalism carries both costs and benefits. The costs are, for the most part, opportunity costs associated with relatively dense and inward-looking networks that are thus closed to new sources of information from the outside. The benefits are, for the most part, reduced transaction costs associated with long-term, implicit contracting.

For Japan, the benefits of relationalism clearly outweighed the costs in the 1950s, 1960s, and 1970s, when it was struggling to catch-up with more advanced industrial economies by adopting and commercializing Western know-how, or -- to invoke Samuels’ concept of a “three-note chord” -- by pursuing technological autonomy and diffusion, and by nurturing the private industries that use such know-how.<sup>15</sup> Indeed, relationalism helped sustain the momentum of development in Japan during this period.

In their critiques of neoclassical economic theory, Hirschman and Murakami distinguish between mature or developed markets, which they believe the theory is quite capable of modeling, and developing markets, which they contend the theory is woefully unable to grasp.<sup>16</sup> Hirschman focuses on what could be called “proto-development,” an early phase in the process when capital markets are characterized by problems of contract enforcement and product markets are afflicted with imperfect or incomplete information – the makings, in short, for a classic prisoners’ dilemma. In this environment, risk-taking activities are

impeded, Hirschman writes (p. 26), “by imperfections in the decision-making process.” Undeveloped economies become swamped by uncertainty due to a dizzying array of “unexploited opportunities.” To overcome these market failures, the state can provide an important, even catalytic, function. It can virtually jump-start a stalled economy, providing the needed spark.<sup>17</sup>

Murakami focuses on a later phase of the process – what could be called “dynamic development” – in which firms in developing economies adopt successively more sophisticated technology from the global pool of established know-how, thereby achieving declining long-run average costs (LRAC) or, in other words, increasing returns. Neoclassical theory, he argues, cannot grasp this process because it largely ignores the variable of technological change.<sup>18</sup> It assumes that all markets are like those in mature or developed economies, where firms *do* face increasing LRAC, and thus diminishing returns (which create the upward sloping supply curve drawn in modern economics textbooks), because they operate at the global technological frontier and thus cannot simply adopt existing know-how.

For developing economies, then, the challenge is not merely the one described by Hirschman; that is, how to launch the dynamic process of technological absorption. It also includes the one described by Murakami; that is, how to sustain this process. That is because development spawns social instability and economic inefficiency as firms race to invest larger and larger sums in industries characterized by declining LRAC. Allowed to run its course, this “investment race” will lead first to excess capacity and later to bankruptcies and unemployment, both of which impose deadweight losses on a developing economy.<sup>19</sup> Without some coordination, then, this “race” is likely to hit a dead-end by spawning monopolistic or highly oligopolistic industries.

Japan, stitched together by the mutually reinforcing linkages of relationalism, avoided this outcome and sustained its developmental momentum. At the macro-level, the ties between government and business fostered a stable environment for firms to invest, step-by-incremental step, in more advanced technologies.<sup>20</sup> And at the micro-level, the ties between industry and universities, between firms, and within firms combined the benefits of internalization (reduced transaction costs through constant information exchange) with the benefits of marketization (reduced governance costs). In particular, these ties encouraged the rapid diffusion of existing technology -- at least within the designated, socially constructed channels.

Imai and Yamazaki argue that Japanese elites followed a Schumpeterian path, using a series of overlapping networks -- centered around the large manufacturing firm -- to develop and utilize new technologies.

The Japanese system is coordinated through multi-layered networks, including inter-firm, inter-industry, inter-governments, universities and corporations, and other networks, which have their own “micro-macro



information loop” as a linkage and coordinating method. The supplier network is an example at the inter-firm level. MITI’s well-known Industrial Structure Council is at the inter-industry level. The “technopolis” is an attempt to create a network of governments, universities, and corporations.<sup>21</sup>

By the mid-1970s, relationalism had transformed Japan into an economic giant that had leapfrogged from transistor radios and toys to TVs and VCRs to computers and semiconductors. At the same time, however, Japan’s techno-industrial regime began to show its age. The costs of strong network ties -- manifested in collusive or rent-seeking behavior and extremely rigid markets -- began to outweigh the benefits. This shift occurred because Japan had achieved technological “catch-up.” Its firms, now operating at the global technology frontier, could no longer capture market share merely by adopting existing know-how and expanding output. Now they themselves had to engage in radical innovation.

That Japan had achieved “catch-up” by this time is confirmed by figures on total factor productivity (TFP), the weighted average of labor and capital productivity.<sup>22</sup> For Japanese manufacturers, the annual growth in TFP averaged 2.2 percent a year between 1955 and 1973, but then fell to only 0.75 percent a year between 1973 and 1980. Cameron constructs an index of total factor productivity for Japanese industry, relative to the U.S., and estimates that Japan’s level was 61 percent of the U.S. level in 1955, 86.7 percent in 1973, 101.1 percent in 1980, and 98.8 percent in 1990.<sup>23</sup>

If Japan had, by the mid-1970s, exhausted the imitative possibilities inherent in “catch-up” development, how then did it manage to keep outperforming Western economies in the late 1970s and 1980s? After all, Japan was the first industrialized country to recover from the first oil crisis and its stagflationary effects. The answer is that Japanese firms disguised their structural problems during this period by investing massive amounts of capital -- as much as 41 percent of GDP in 1973 -- far more than other industrialized countries at the time. These investments, however, proved less and less efficient, generating lower and lower returns.<sup>24</sup> Indeed, the rate of return on Japan’s gross fixed capital stock fell precipitously -- from 34 percent in 1955 to 18 percent in 1970, and continued to fall. Or, to use a slightly different measure, a \$1 increase in Japan’s capital stock yielded less than a 20 cent increase in its GDP in the mid-1970s -- a miserable fraction of the \$1.20 cent increase it earned in the late 1960s.<sup>25</sup>

Capital investment remained high, eventually fueling a financial “bubble” characterized by massive asset inflation, but Japan’s technological development slowed during the 1980s. In the computer industry, for example, the value-added to sales ratio “plunged steeply” -- from 30 percent in 1982 to 22 percent in 1991, according to Yamada and Okumura. This industry, once imbued with great expectations for high growth, “joined the ranks of ordinary manufacturing industries . . . and is no longer a lucrative undertaking.”<sup>26</sup>

What went wrong? Relationalism, it seems, outlived its utility and became a net drag on the Japanese economy. But political and economic elites, reluctant to abandon the investments they had made in relational networks, failed to carry out structural reform of Japan's techno-industrial regime.<sup>27</sup> Bureaucrats continued to collaborate with business executives in formulating and implementing industrial policies, but enjoyed less and less success. As Callon notes: MITI (now METI) "discovered that pushing out on the technology frontier was much more difficult than the catch-up policies that targeted existing technologies that had been perfected by the United States."<sup>28</sup> Meanwhile, major corporations continued to use inter-firm and intra-firm ties to pursue market share maximization, as they had all along, but no longer seemed able to maximize profits.<sup>29</sup> Figure 1 reveals how large Japanese corporations began in the mid to late-1970s to earn far lower returns than their counterparts in the United States.

It was not, however, until January 1991, when Japan's speculative "bubble" popped, that political and economic elites faced a real crisis. Manufacturers struggled to hang onto sales volumes as productivity declined slowly but steadily to the point that, by 1994, Japan's productivity was about 34 percent lower than the U.S. rate.<sup>30</sup> Profits suffered, too, as the economy slumped into recession. Compounding the market pressures on Japan's techno-industrial regime were political pressures from Japan's trading partners. In the first half of the 1990s, the U.S. pursued a new "results-oriented" and "managed trade" policy that took aim at Japanese automobiles and electronics goods.<sup>31</sup> Other countries, while not as aggressive, also criticized Japan for its persistent trade surplus. In the latter half of that decade, the U.S. pushed Japanese government officials to roll back regulations that inhibit the development and expansion of new business activities.

This time, Japanese elites understood they could no longer tinker with the existing techno-industrial regime. Two choices remained: they could dismantle it, relying more on spot markets and less on firmly established relationships to carry out exchange. Or they could try to expand its scope; that is, they could try to rescue relationalism by extending its social networks into a new and more fertile environment in which firms might still be adopting existing technology, and thus one in which relationalism might continue to generate net gains.

An essay by a well-regarded economist reflected a new consensus. Japanese manufacturers, Itami Hiroyuki wrote in 1993, had become hemmed in by two walls: the "wall of the system" (Japan's outmoded techno-industrial regime), and the "wall of the world," which he contended the West built to keep out Japanese manufactured imports. Asia, he wrote, offered a way for Japanese manufacturers to clear both walls. With its young, still developing economies, the region offered promise: cheap and plentiful land, affordable and literate labor, and -- best of all -- a set of welcoming arms. Asia beckoned, Itami wrote, and Japanese manufacturers should respond by setting up plants in the region.<sup>32</sup>

Regionalization, as we shall see, offered relief; that is, it opened a critical avenue for reconfiguring, and thus rescuing, the increasingly fragile web of relationalism.

### 3. Regionalizing Relationalism

In the early 1990s, as Japan sank deeper and deeper into the Heisei recession, the nation's interest in Asia seemed to rise higher and higher. Political and business elites brimmed with enthusiasm about the region. In 1992, Hosoya Yuji, then deputy director of MITI's industrial policy bureau declared that "Japan's main target [for trade and investment] must be Asia."<sup>33</sup> A year later, Keidanren, Japan's big business federation, noted that Asia had become "an indispensable part of the business and procurement activities of Japanese companies." Economic ties between Japan and other countries in Asia benefit both sides, and thus should be strengthened, according to the federation. "Japanese companies will have to form a closer cooperative relationship in an effort to secure their international competitiveness."<sup>34</sup>

This heightened rhetoric was matched by new initiatives in the region. For example, the Japanese state stepped up its Official Development Assistance (ODA), providing \$4.2 billion to Asia in 1995 -- a sharp increase over 1990, when it gave \$3.1 billion. Although most of this money came in the form of yen loans for dams, sewers, electrical transmission lines and other infrastructure projects, an increasing amount came in the form of technical assistance. The Japan International Cooperation Agency (JICA) dispatched more and more Japanese "experts" to Asia, where they advised host governments and local industry on everything from industrial policy to manufacturing quality standards. Table 1 documents the increasing presence of JICA "experts" in Asia.

But the more dramatic action occurred on the private side as Japanese industry began to move aggressively into Asia. As Figure 2 shows, manufacturing investment in the region climbed sharply in the first half of the 1990s, reaching \$7.8 billion in 1995, or almost 42 percent of all foreign direct investment (FDI) by Japanese producers. Represented in terms of projects rather than value of investment, the movement into Asia is even more impressive: Two-thirds of all the factories set up overseas by Japanese firms are located in Asia.<sup>35</sup>

In addition to traditional forms of FDI, Japanese manufacturers engaged heavily in what are often called "intermediate" forms of overseas investment, particularly franchise contracts and technology licensing agreements with Asian partners.<sup>36</sup> As Table 2 indicates, Japanese technology exports to Asia doubled between 1991 and 1996, when they reached \$2.75 billion. Since the mid-1990s, the region has received roughly half of all technology exports from Japan.

More than anything else, it was this export of Japanese capital and technology that helped weave together the economies of Asia, where intra-regional trade had -- until the economic

crisis of 1997-98 -- grown faster than anywhere else in the world. Indeed, regional integration has been driven largely by the business strategies of Japanese firms, or networks of firms, which have sought to construct a hierarchical division of labor based on the different but complementary factor endowments and industrial structures, and thus the different but complementary comparative advantages, of Asian economies. Put simply, Japanese multinational corporations (MNCs) have tried to distribute production activities among various locations in the region according to the technological level of the host economy.<sup>37</sup>

Japanese electronics firms have pursued such strategies most aggressively, creating vertically layered intra-firm or intra-network supply chains that use technology-intensive production from Japan, capital-intensive production from the Asian NIEs, and labor-intensive production from China and the ASEAN-4. More specifically, the Asian affiliates of these Japanese MNCs assemble finished products with high-tech components imported from Japan, slightly less complex parts imported from the Asian NIEs, and the most simple, standardized parts from China and the ASEAN-4. For example, to manufacture VCRs at its assembly plant in Bangi, Malaysia, Sony imports integrated circuits and other high-tech components from Japan, and printed circuit boards from Singapore. It also purchases tape decks, as well as many other standard parts, from local suppliers in Malaysia, many of them Japanese.<sup>38</sup>

Automobile manufacturers, taking advantage of ASEAN programs (such as the 1988 Brand-to-Brand Complementation (BBC) scheme and the ASEAN Industrial Cooperation (AICO) scheme) to reduce tariffs on certain kinds of intra-regional, intra-industry trade, have built their own supply networks in Southeast Asia. In general, these involve swapping parts that are produced in larger volumes at specified factories across the region, and then assembling them in finished vehicles. Toyota, for example, used its affiliate in the Philippines as a base for specialized production of transmissions, its affiliate in Indonesia for gasoline engines, its affiliate in Malaysia for steering gears and electronic components, and its affiliate in Thailand for diesel engines and pressed parts.<sup>39</sup> In 1996, only four years after it set up its regional production network, Toyota moved nearly \$200 million in parts between its plants in Southeast Asia.<sup>40</sup>

Tamura writes that Japanese MNCs are building a regional division of labor that emphasizes technology-intensive “prototype” production in Japan and mass production of standardized products in Asia. These manufacturers, he concludes, “view Japan and Asia as one interconnected zone of activity...”<sup>41</sup>

Indeed, it has become increasingly clear that Japanese manufacturers are trying to regionalize the techno-industrial regime they helped establish over a number of years in Japan. That is, they are seeking to extend into Asia their own embattled web of strong relational ties. This should not surprise us. As Doremus, Keller, Pauly, and Reich have demonstrated, MNCs are rarely “multinational” (or, to use their term, “global”).<sup>42</sup> In most

cases, they possess a national identity that is shaped by the distinctive norms and institutions embedded in their home country. Japanese MNCs are thus guided by the norms and institutions of cooperation that make up relationalism, and they have found it easier to replicate these norms and institutions in Asia, where they have some salience, than they have in Europe or the Americas.

### **Government-business ties**

The Japanese state, under pressure to quit meddling in the domestic market, has found a new mission for itself in Asia. It serves as a midwife to Japanese manufacturers in the region, working to help them realize their business strategies.<sup>43</sup> In speeches and policy reports, government officials have argued that a regional division of labor will contribute to a dynamic process of “industrial sequencing” as more advanced economies in the region “pass down” industries in which they no longer enjoy a comparative advantage -- much as an older sibling passes down out-grown clothes to a younger sibling. They have called this the “flying geese” pattern of regional economic development, a V-shaped pattern with Japan as the “lead goose,” followed by the Asian NIEs, followed further by ASEAN and China.<sup>44</sup>

In the early 1990s, this concept became enshrined as official policy toward the region. Thus, Prime Minister Kaifu Toshiki told a Southeast Asian audience that

Japan will .... continue to seek to expand imports from the countries of the region and promote greater investment in and technology transfer to these countries, in line with the maturity of their trade structure and their stage of development. And as the necessary complement to this effort, I hope that the host countries will make an even greater effort to create a climate receptive to Japanese investment and technology transfer.<sup>45</sup>

MITI (now METI) has, from time to time, tried to coordinate this effort to construct a regional division of labor, or what it officially called “complex international work sharing” based on “agreed specialization”<sup>46</sup> In the early 1990s, it pushed the New Asian Industries Development (New AID) plan, an ambitious scheme to coordinate Japan’s aid, investment, and trade policies toward the region. The plan was designed to stimulate export-oriented manufacturing throughout Asia, and to help Japanese firms upgrade their domestic operations by transferring labor-intensive production to new offshore facilities. MITI vowed to implement the program in three phases: 1) collaboration with counterparts in host countries to identify specific industries that, with some nurturing, might become internationally competitive; 2) the drafting of proposals to promote those targeted industries, usually relying on a mixture of “hard infrastructure” (such as roads and electrical transmission lines) and “soft infrastructure” (such as new Japanese-style organizations reflecting cooperation between government and business); and 3) issuing yen loans and dispatching experts to implement these programs.

MITI's New AID plan was heavily criticized by other ministries in the Japanese government, particularly the Ministry of Foreign Affairs, which viewed it as an effort to take over Japan's foreign aid program. So MITI dropped the plan, but not the vision behind it. That vision, spelled out in its annual statement of policy priorities, continued to be "the creation of open industrial networks" and "the support of Japanese business activities in Asia."<sup>47</sup> In the mid-1990s, MITI rolled out a new initiative to export industrial policies to Asia -- the Cambodia-Laos-Myanmar Working Group (CLM-WG), which sought to promote the industrialization of those transitional economies. MITI proudly noted that this new policy group was based in Bangkok, not Tokyo, and insisted that it reflected an equal partnership between ASEAN (represented by the ASEAN Economic Ministers, or AEM) and Japan (represented by the MITI). In fact, however, CLM-WG was financed and staffed exclusively by MITI.<sup>48</sup> The organization soon evolved into the AEM-MITI Economic and Industrial Cooperation Committee (AMEICC), and broadened its coverage to include all of Southeast Asia. It also expanded its mission by, for example, pushing for stronger industrial linkages and more liberal investment policies throughout the region.

Other Japanese government-affiliated groups, such as JICA, also use industrial policies to try to guide host states and local firms in Asia. In the mid-1990s, as Japanese assemblers sought to replicate their domestic keiretsu networks in Asia, this guidance often centered on how to develop supporting industries -- particularly in the consumer electronics and automobile industries. For example, a JICA team in Thailand produced a detailed study that led, in 1995, to the Thai Ministry of Industry's "Master Plan for Supporting Industries."<sup>49</sup> In addition, a JICA representative (the former director-general of MITI's Consumer Goods Bureau) began advising the Thai government in 1998 on how to set up a public finance corporation for small and medium sized enterprises (SMEs).<sup>50</sup> MITI/METI, however, remains the most active agent in establishing and implementing this agenda. It has, for example, created a regional council, including government and industry officials from ASEAN countries, as well as government and industry officials from Japan, to propose policies designed to foster the growth of SMEs in Southeast Asia.<sup>51</sup>

Under MITI/METI's guidance, Japanese business groups have encouraged their Asian counterparts to build up not only nationally-based trade associations but also, for the first time, regionwide industrial associations that directly reflect Japanese business interests. Thus, the Japan Automobile Manufacturers Association (JAMA) encouraged automakers in Southeast Asia to reorganize and revitalize their flagging ASEAN Automobile Federation (AAF); the Japan Electrical Manufacturers Association (JEMA) and Electric Industries Association of Japan (EIAJ) joined forces with Asian manufacturers to establish a new regional grouping, Business Dialogue; and the Communications Industry Association of Japan (CIAJ) launched the Asian Telecommunications Industry Exchange.<sup>52</sup> A major purpose of the new regional organizations is to harmonize product and safety standards as well as certification procedures among members. MITI noted that, although U.S. standards often become defacto global standards, the European Union has moved to

establish its own regional standards in some fields. It stressed, "There is an urgent need to create standards based on the particular requirements of the Asia-Pacific region."<sup>53</sup>

Japanese bureaucrats advise not only host states and industries in Asia, but also Japanese firms seeking to invest in Asia, as well as Japanese firms that already have invested in Asia. When conducted in Japan, this guidance often takes the form of business counseling, and is directed at SMEs looking for tips on suitable industrial sites and possible joint venture partners. Indeed, the government now publishes a manual describing all the programs available to smaller firms contemplating a move overseas. The manual (*Chûshôkigyô Kokusaika Shien Manyuaru*) was only 63 pages in 1996, when it was first published by MITI's SME Agency. Two years later, it was 116 pages.

In some cases, however, administrative guidance is aimed at large firms, and may be used to encourage cooperative or even collusive behavior. That was the case in 1992, when MITI called together representatives of the consumer electronics industry and tried to reach a loose agreement on which companies would invest how much money to manufacture what products in which countries.<sup>54</sup>

Outside Japan, MITI/METI uses another one of its arms, JETRO (Japan External Trade Organization), which operates 10 support centers throughout Asia, to guide Japanese firms that have already built factories.<sup>55</sup> In 1990, it announced a plan to create public-private councils in major cities throughout the region to provide what it called "local guidance" to those affiliates.<sup>56</sup> And more recently, in 1996, it set up the Asian Industrial Network Program to pool information on suppliers and joint venture partners.<sup>57</sup> JETRO has provided an important coordinating function for Japanese affiliates in Asia; for example, in 1991 it helped broker an informal agreement among Japanese electronic manufacturers in Malaysia that led to a wage cartel curbing competition for the scarce supply of electrical engineers in that country.<sup>58</sup> The Japanese government defends its role in brokering such overseas agreements by citing the threat presented by "excess competition" between Japanese MNCs in host economies.<sup>59</sup>

Guidance may also be packaged in the form of financial incentives. In a sharp contrast with its Western counterparts, the Japanese state actively subsidizes private overseas investment, particularly FDI to Asia. This is a source of pride for the Japan Export-Import Bank, which notes that "the use of public funds to finance private overseas investment is relatively unique to Japan, with almost no parallel in other countries."<sup>60</sup> While the government's share of FDI financing has diminished in recent years as firms have drawn more heavily on their own resources and on commercial banks (particularly Japanese banks that have set up branches in Asia), its absolute contributions have actually grown quite substantially. In addition, the relative weight of FDI financing in total government lending activity also has increased. Beginning in the mid-1980s, the Export-Import Bank began to shift its focus from export credits to overseas investment loans -- especially to Japanese firms setting up shop in Asia. By 1996, it was lending \$331 billion to support private

investment in the region -- double what it lent in 1993 and 28 times what it lent in 1986. As Table 3 shows, such financing for regionalization became nearly a quarter of the bank's total business by that time.

Besides the Export-Import Bank, which deals mainly with large firms, three government-affiliated financial institutions have used public funds (postal savings) from the Fiscal Investment and Loan Program, a key vehicle of industrial policy during the 1950s and 60s, to guide small and medium-sized enterprises into Asia.<sup>61</sup> Those banks (Shôkô Chûkin; the Japan Finance Corporation for Small Business; and the People's Finance Corporation) have been given new or expanded responsibilities -- in large part due to the credit squeeze facing SMEs during the long economic recession in Japan, but also in part due to the new emphasis on encouraging regionalization.

For example, under a law passed in 1987 and revised in 1995, these government banks are now specifically authorized to subsidize efforts by small firms to enter new fields -- including, literally, foreign fields. This program was intended to help SMEs cope with the ongoing process of "hollowing out," a process that, for them, means the loss of domestic markets as their Japanese customers (often assemblers of automobiles or electronic goods) move overseas. Ironically, though, it includes a remedy that contributes to the larger problem of "hollowing out." The Japan Finance Corporation for Small Business (JFS) has been the most aggressive lender, using nearly 70 billion yen to finance 844 overseas investment projects between 1987 and 1996. And 90 percent of those projects have been in Asia.

### ***Business-Business Ties***

In the 1990s, Asia emerged as the overseas base for Japanese subcontractors in a variety of machine manufacturing industries. For example, between 1992 and 1994, Japanese affiliates manufacturing electronic components in places such as Bangkok and Penang saw their sales go up by 41 percent while their parent companies in Japan saw sales fall by 8 percent.<sup>62</sup> This disparity in sales was especially marked in such high-tech fields as computer parts (a 101 percent increase for Japanese affiliates in Asia; a 14 percent drop for Japanese parents at home).

Equally explosive was the expansion of Japanese automobile parts suppliers into Asia. In the 35 years from 1962 through 1997, Japanese auto parts producers made 405 investments in the ASEAN-4 countries of Southeast Asia (Thailand, Indonesia, Malaysia, and the Philippines); but they made 223 of those investments (or 55 percent) in the final six-year period from 1991 through 1997.<sup>63</sup> 1996 was the peak. Of new overseas production bases established by Japanese auto parts manufacturers that year, 76 percent were in Asia.<sup>64</sup>

Indeed, the region has attracted the lion share of overseas manufacturing investment by small and medium-sized firms from Japan. In 1994, 81 percent of FDI projects undertaken



by Japanese SMEs ended up in Asia; even in 1997, 55.3 percent chose this region in spite of its economic woes.<sup>65</sup>

This concentration of investment did not occur by accident. In the 1990s, Japanese machinery assemblers sought to consolidate their regional production networks by purchasing parts from Japanese-affiliated suppliers in host economies. Purely local suppliers apparently could not meet exacting standards for quality and punctuality, and a highly valued yen raised the cost of importing parts from Japan. So “parent” firms (machinery assemblers) leaned on their subcontractors to follow them into Asia.

One that felt the pressure was Nippon Electronics, a relatively large producer of printed circuit boards for Japanese electronics manufacturers such as Sony, Matsushita, and Sanyo. Although it fully expected to end up losing money in the short run if it built a factory in Malaysia, it decided to make the move anyway. The company felt it had a “responsibility” (*sekinin*) to its longtime customers, according to Takano Tatsuo, managing director of the subsidiary outside Kuala Lumpur.

For several years, our [Japanese] customers in Southeast Asia asked us to come and support them. They asked and asked, and finally we came. We had no choice really.<sup>66</sup>

Regionalization has helped cement relations between assemblers and their key suppliers in Japan, relations that had threatened to unravel during the 1990s and the protracted slowdown in the domestic economy. This is in fact a stated goal of the MITI (now METI) agency that oversees relations between manufacturing assemblers and subcontractors in Japan. In one report, the agency encourages suppliers to “become part of the supply architecture of globally based parent companies” and thereby maintain or perhaps even strengthen ties with their customers or “parents.”<sup>67</sup>

These linkages inspired Adachi to refer to Japanese manufacturing investment in Asia as “convoy-style” (*sendan-gata*) FDI because it typically is carried out by an assembler followed closely by his most trusted (first and perhaps second tier) suppliers.<sup>68</sup> This became especially apparent in the 1990s. Table 4 presents the findings of a survey showing that, by 1995, as many as 32.5 percent of all Japanese firms investing in the ASEAN-4 and as many as 21.3 percent of those investing in China indicated they had decided to make the move to “supply parts to an assembly manufacturer,” meaning -- in nearly all cases -- a Japanese transplant.<sup>69</sup> This marked a dramatic increase over previous years.

Far from abandoning their homegrown vertical keiretsu, then, Japanese manufacturers have tried to replicate them – and deploy them strategically – as they expand into Asia. In one statistical study, Belderbos, Capannelli, and Fukao (1998) use a probability test to explain the variation in local content ratios (measured both by local value added and the procurement of inputs from local suppliers) of 157 Japanese electronics manufacturers

operating in Asia in 1992. They find that membership in a vertical keiretsu, especially one with strong intra-group ties, leads to increased local content, particularly for Japanese affiliates operating in places such as Southeast Asia and China, where the indigenous supply base remains weak. This, they conclude, reflects the fact that Japanese MNCs have recreated their supply networks “mostly ... through the establishment of overseas manufacturing plants by existing Japanese manufacturers of parts and components, in which the latter were often assisted by the ‘core’ firm of the keiretsu.”<sup>70</sup>

The strongest Japanese automakers have made the most significant progress in replicating their domestic keiretsu in Asia. At its manufacturing affiliate in Samutprakarn, just outside Bangkok, Toyota assembles vehicles with the help of 32 Japanese parts suppliers operating in Thailand. All but four of these suppliers are members of the Toyota supply keiretsu in Japan.<sup>71</sup> Likewise, the giant automaker has moved into the Chinese port city of Tianjin with 14 of its most important Japanese suppliers to manufacture passenger vehicles. Toyota, according to one news report, is “rebuilding its keiretsu supply system” in Tianjin.<sup>72</sup>

Others have unearthed equally compelling evidence that Japanese automakers are attempting to bring core members of their domestic supply networks with them as they expand into Asia. Nishioka (1998: 66), focusing on ASEAN, concluded that, “with the exception of those cases in which an established supplier has stayed home, we find very few examples of Japanese automakers [in Southeast Asia] engaging in transactions outside their established keiretsu groups.” Likewise, Kasahara (1997: 22) argues that Japanese automakers in Thailand are seeking to capture “relational rents” by conducting almost all of their business with Japanese subcontractors who belong to their parent firm’s keiretsu network.

As they have done at home, Japanese automakers have established cohesive supply groups in each Asian country in which they operate. These groups, which meet regularly under the auspices of the assembler, even carry the same name as the vertical keiretsu in Japan after which they are patterned. Some observers, however, have suggested that Japanese automobile supply networks in Thailand, Indonesia and Malaysia are more “open” and less exclusionary than supply networks in Japan.<sup>73</sup> This observation ignores the fact that automobile markets in Asia are still tiny compared to the Japanese market and that parts suppliers, as a result, are unable to achieve economies of scale -- and thus unable to operate at maximum efficiency -- without selling to a longer list of customers. Indeed, representatives of Japanese automakers in Asia confided that, when their keiretsu suppliers first followed them into the region, they encouraged those suppliers to sell parts to other automakers as well. In the words of one such representative: “We wanted them to get to the point where they could be really efficient and produce parts cheaply. They couldn’t get there by relying solely on us.”<sup>74</sup>

In the long run, as automobile markets in the region expand, we should find that the membership of these Asian supply groups begin to resemble the membership of corresponding networks in Japan. That is, the need to engage in extra-keiretsu transactions will lessen as suppliers begin to achieve economies of scale by selling only -- or chiefly -- to their primary customers.<sup>75</sup> Higashi (1995: 46-7) states this most simply: "As the market grows, the emphasis on *group-ka* (tighter ties inside the group) also grows."

### **Management and Labor**

Japanese manufacturers have incorporated their Asian operations into regionwide personnel systems that allow them to better protect the job security of core or lifetime workers. In this way, the regionalization of Japanese manufacturing has helped block or inhibit structural change in the Japanese employment system. More specifically, it has helped maintain the strong relational ties that have bound longtime employees to their employers.

During the protracted economic slump of the 1990s, the managers of those manufacturing firms scrambled to cut production costs, especially labor costs. Due to longstanding norms and institutions in the domestic political economy of Japan, however, they were not inclined to lay off core or lifetime workers. Instead, they relied on less drastic means such as *shukko* ("seconding," or the temporary transfer of employees) -- including what could be called "cross-border *shukko*" -- to trim their payrolls. Asia, home to an expanding list of Japanese manufacturing affiliates, has thus served as a holding pen, a place to store surplus white-collar workers from Japan.

In the mid-1990s, when Asia was still booming, Honda transferred a large number of supervisors from Japan to its affiliates in the region, especially Thailand. This eased some of the growing pressure at home, according to a Honda spokesman. "Our network of operations [in Asia] provides more flexibility in personnel management."<sup>76</sup>

Nissan used its Asian affiliates in much the same way. "We have too many managers at Nissan Motors in Japan," confides an executive for the automaker. "Our overseas operations give us a convenient way to relieve this excess supply of management staff."<sup>77</sup>

In the 1990s, when it struggled to reduce its domestic employment by 10,000 workers, Hitachi relied heavily on natural attrition, an early retirement program, and temporary transfers, including cross-border *shukko*.<sup>78</sup> In 1991, the electronics giant had 450 Japanese managers stationed overseas, including Asia; by 1996, that number had nearly doubled to 830. Hitachi's experience is not extraordinary. As Table 5 shows, the total number of Japanese employees at private firms in Asia increased almost twofold over that period, reaching 103,688 by 1996.<sup>79</sup>

Cross-border *shukko* can, of course, move in either direction. Parent companies in Japan, using what they call "on-the-job training programs," routinely import less-skilled Asian

workers from their regional affiliates and put them to work on home-based assembly lines, and particularly in “3 K” jobs (that is, *kiken*, *kitsui*, *kitanai*; or in English, dangerous, difficult, and dirty jobs). This can happen either when the supply of Japanese workers willing to perform such labor in Japan is low, or -- as we shall see below -- when the supply of Asian workers at overseas affiliates becomes excessive. For example, in 1992, Toyota sent about 200 workers from its assembly plant in Indonesia to its plants in Japan to receive on-the-job training. This was double the number of “trainees” sent in an average year. Why? Nakamura and Padang provide a succinct explanation: The parent company in Japan “was experiencing a boom and faced a shortage of manpower ... [while its affiliate in Indonesia] did not have favorable market conditions and suffered from excessive manpower.”<sup>80</sup> In addition, parent companies in Japan may move export-oriented assembly lines -- and thus jobs -- back to Japan when relative costs shift in response to exchange rate adjustments. For example, in 1997, when the yen weakened against the dollar, Matsushita moved its production of 16 inch and 25 inch color TV sets back to Japan from Malaysia -- even though it anticipated having to run its Japanese plants at a loss for at least a short time. It did so because it wanted to protect domestic jobs, according to Shirafuji Hiroyuki, managing director of Matsushita TV.<sup>81</sup>

Thanks to this ongoing concern about domestic employment, leading Japanese labor organizations have been able to express qualified support for business plans to “rationalize” production activities through regionalization. In one report, Denki Rengō -- the Electrical Workers Union, a subset of the conservative Rengō (Japan Trade Union Confederation) -- argues that Japanese manufacturing investment in Asia, carried out as part of a regional division of labor, can actually protect the jobs of skilled core employees in Japan.<sup>82</sup> This position is quite different from the one taken by Rengō’s U.S. counterpart, the AFL-CIO, in the debate over the North American Free Trade Agreement.

#### **4. The Asian Fiscal Crisis**

In 1997, a fiscal crisis spread like a virus through much of Asia, enfeebling what until then had looked like healthy, even vibrant economies. Surprisingly, though, the crisis did not undermine ongoing efforts to regionalize relationalism. Japanese business and political elites used extraordinary measures to cope with the collapse of markets in Asia and, in the process, may actually have increased Japan’s influence in the region. For example, between November 1997 and January 1999, 244 joint ventures in Thailand received life-saving transfusions of capital from their foreign parents -- and nearly two-thirds of that money came from Japan.<sup>83</sup> In other words, while many American, European, and Korean manufacturers reduced their presence in the market, Japanese MNCs held on for dear life.<sup>84</sup>

By late 1999, when the crisis showed signs of easing, this “hang-tough” strategy was already paying off. In Thailand, Mitsubishi Motors was preparing to quadruple its annual production of automobiles and was moving ahead with plans to use some of its increased capacity to build an “Asian car.”<sup>85</sup> In Indonesia, Toshiba was able to begin expanding production of cathode ray tubes for color TVs after Korean producers closed their assembly

lines. "In some areas, we are facing less competition," said Tsubota Yutaka, manager of the conglomerate's Asian operations.<sup>86</sup> "We are already as profitable [in the region] as we were before the crisis." Toshiba apparently is not alone. JETRO reports that 75 percent of Japanese manufacturers in Southeast Asia expected to break even or turn a profit in 1999.<sup>87</sup>

In the face of this crisis, Japanese manufacturers managed to hold onto their all-important supply networks in Asia. For example, in Thailand, where scores of local suppliers went bankrupt and an equivalent number of foreign suppliers shut down their factories, not a single Japanese parts producer gave up -- despite having to operate at sometimes as little as 20 percent of production capacity.<sup>88</sup> How did they do it? The answer reveals an interesting twist: In this instance, relationalism actually bailed out regionalization.

Consider what happened in the automobile industry. Parent companies in Japan pursued a three-pronged strategy to help Japanese subcontractors in Asia.

- First, they provided emergency financial assistance to members of their regional supply groups. Toyota, for example, agreed to make advance payments to its parts producers throughout Asia, and financed critical but short-run expenses such as the lease of equipment.<sup>89</sup> Nissan also came to the defense of its beleaguered parts suppliers in Thailand, subsidizing up to \$26 million in production there.<sup>90</sup>
- Second, to breathe some life into an otherwise flat market, the parent companies temporarily assigned to their affiliates in Asia some of the production chores that had, until then, been done entirely in Japan. Toyota, for example, gave its Thai affiliate the responsibility of manufacturing -- and then exporting -- a line of pick-up trucks. Stanley Electric transferred a share of the production of headlights to its affiliate in Thailand.<sup>91</sup> Mitsuba, meanwhile, turned over all production of IC flasher relays to its Thai affiliate, which then exported the goods back to Japan.<sup>92</sup>
- Third, parent firms dramatically boosted the import of parts from struggling parts suppliers in Asia. Toyota was buying only 2.5 billion yen worth of auto parts from Japanese subcontractors in Asia in 1997, when the region's economic crisis began; by 2000, however, it was planning to import auto parts valued at 14 billion yen -- a nearly six-fold increase.<sup>93</sup> In just one year (1998), Honda increased its import of auto parts manufactured in Thailand by 150 percent.<sup>94</sup> MMC, likewise, began importing parts from Japanese suppliers in Thailand and using them in its Galant, produced in the U.S., and its Lancer, produced in Japan (Mori 1999: 23).

To ride out the economic storm in Asia, Japanese automakers had to do more than just shore up their supply base; they also had to hang onto their labor force. Here, too, regionalized relationalism came in handy. To cite just one example, Toyota officials boast that they did not lay off regular employees in Southeast Asia during the crisis -- even

though they had to suspend production at several factories.<sup>95</sup> One reason they were able to fulfill their pledge of protecting jobs was that they dramatically expanded their program of sending overseas employees to Japan for training. In 1998, at the peak of the crisis, Toyota doubled the number of Southeast Asians in its training program (from 250 to 500), and doubled the amount of time spent in Japan (from an average of three months to an average of six months) (Fourin 1998b: 6). The Japanese state helped finance this and other training programs through the Association for Overseas Technical Scholarships, an arm of MITI (now METI).

For Japan's political elites, the economic crisis in Asia has presented a difficult challenge, but also a golden opportunity. "Our status in the region has increased, and so has our budget at home," boasted one official.<sup>96</sup> MITI/METI, in particular, has used the crisis as a pretext to aggressively pursue its controversial scheme of implementing a regionwide industrial policy. It has convened "joint public-private sector dialogues" under the auspices of AMEICC in Bangkok to consider how it can work with state officials in each country to help "guide" investments that will contribute to the development of the entire region.

To promote economic recovery, Japan announced in 1998 that it would dramatically increase the flow of ODA loans and grants, as well as technical assistance, to its hardest-hit neighbors in Asia. On its face, the emergency plan to spend \$80 billion over 10 years seems undeniably generous. But upon closer inspection, one finds that it includes a number of items designed to strengthen relational ties between the Japanese state and Japanese industry, as well as to help maintain interfirm and labor-management ties.

First, the aid package renews the controversial practice of "tying;" that is, providing financing for a project only on the condition that it is carried out by home country firms. Asian countries hit by the crisis will receive a total of \$6 billion in "special loans" over three years for equipment purchased from Japanese suppliers or for public works performed by Japanese contractors.<sup>97</sup>

Second, the package makes it possible to dispatch an unprecedented number of JICA experts to Asia, providing advice to host country officials on everything from industrial structure reform to trade finance.<sup>98</sup> This advice, as noted earlier, tends to favor the interests of Japanese MNCs operating in those countries. And in the case of a new program proposed by the head of Nikkeiren (Japan Federation of Employers Associations), this advice will also serve the interests of some firms remaining in Japan. For the first time ever, the government is recruiting "white collar experts" from Japan's private sector -- particularly its financial institutions -- to provide guidance to Asian governments on such matters as accounting and auditing. All of the volunteers -- an estimated 1,000 each year -- are between the ages of 40 and 69; many, it turns out, have been rendered superfluous by the hard economic times in Japan. For this reason, says a JICA official, the program can help Japanese firms as well as Asian governments. "In most of these Asian countries, there

is a serious shortage of administrators trained in fields such as financial management. On the other hand, in Japan, we now have an excess number of such people.”<sup>99</sup>

Finally, the massive aid package includes a significant amount of financing for Japanese firms in Asia, particularly the SMEs that make up an all-important supply base for machinery assemblers and that might otherwise be tempted to withdraw from the region. Some of this money goes to host governments, which in turn loan it to private interests. Malaysia, for example, is receiving such a “two-step” loan (\$160 million in 1999) for SMEs, and especially Japanese suppliers, suffering from a credit crunch in that country. Much of the money, however, is channeled to Japanese firms through government-affiliated banks in Tokyo. For example, as of July 1999, the Export-Import Bank of Japan had agreed to provide \$900 million in additional assistance to Japanese affiliates in Indonesia through what it calls “investment financing.”<sup>100</sup>

Furthermore, these government-affiliated banks are now authorized to not only subsidize new overseas investment for plant and equipment, but also to provide operating funds for Japanese SMEs in jeopardy of closing down existing facilities in Asia. Government money is loaned to the parent company in Japan, which is then expected to inject capital into its affiliate in Asia. In just the first three months of 1999, JFS loaned nearly \$10 million to keep 14 affiliates afloat.<sup>101</sup>

In addition, MITI/METI has tried to maintain investment in Asia by expanding its already generous program insuring foreign bank loans for the overseas activities of Japanese affiliates. In March 1998, the government announced it would begin to cover ordinary credit risks, such as the bankruptcy of an overseas affiliate borrowing money.<sup>102</sup> Then, a few months later, it announced it would relax the insurance program further by eliminating the requirement that Japanese parent firms participate in providing up-front guarantees for overseas loans made to their affiliates.<sup>103</sup>

The Japanese government has not tried to disguise the fact that its massive bailout plan for Asia is also designed to help Japanese industry. Indeed, when he announced his \$30 billion piece of the package in 1998, Finance Minister Miyazawa Kiichi noted candidly that a substantial sum would go to Japanese SMEs. The government justified the expenditures in these terms:

Japanese companies, which have contributed greatly to the economies of these countries, are also facing difficulties due to the economic crisis. If this situation continues, it would be difficult to invigorate these economies with new economic activity, with the strong possibility that many companies might have to pull out of the region. This would be damaging to the local economies, and could possibly have damaging effects on the bilateral relationships of these countries with Japan.<sup>104</sup>

## 5. Techno-Nationalism

In a 1993 interview, Kôzuki Yatsugu, the former president of the Japanese Chamber of Commerce and Industry in Singapore, argued that Japan must regionalize carefully -- or risk losing its technological autonomy. Parent firms, he advised, should not give up too much authority to their local affiliates.

In my personal opinion, we should keep the control in Japan. Once you lose that control, that power, it never comes back. It never returns. All you have to do is look at what happened to England in the late nineteenth century, or what is happening to the United States today.<sup>105</sup>

Kôzuki's view reflects what Samuels has identified as a longstanding ideology of techno-nationalism, a belief that a nation's security depends fundamentally on its overall technological capacity.<sup>106</sup> This ideology, used by Meiji elites to promote industrialization in the late 19th century, informed domestic institutions in the postwar period as Japan raced to catch-up with the United States. And more recently, this ideology has informed the corporate strategies of Japanese MNCs operating in Asia, where they have proven reluctant to set up overseas R&D facilities and to use indigenous suppliers, and where they have moved slowly to localize management. Instead, Japanese multinationals in this region have continued to rely on longstanding relational ties with co-nationals. As Itami puts it, "the East Asian networks of Japanese corporations are integrated extensions of domestic production systems."<sup>107</sup>

Let us first consider the use of subcontractors in Asia. JETRO reports that 47 percent of the nearly 900 Japanese manufacturing affiliates it surveyed in Southeast Asia in 1998 were relying on Japanese transplants for most of their locally purchased parts and materials.<sup>108</sup> And in certain industries, this figure is much higher. For example, 100 percent of Japanese automakers in Thailand and 88 percent of Japanese electronics manufacturers in Indonesia reported that they relied on Japanese suppliers for at least half of their local inputs. In a study commissioned by the government of Thailand, the Foreign Investment Advisory Service finds that Japanese affiliates in Asia's electronics industry "tend to bring their own subcontractors from Japan or create their own satellite subcontractors, neither of which generates significant backward linkages with domestic firms."<sup>109</sup> Likewise, Okamoto expresses concern that export-oriented production by Japanese electronic firms in Southeast Asia is carried out in "enclaves" that are well connected to Japanese subcontractors in the region, but rather poorly connected to truly local firms.<sup>110</sup>

The automobile industry is no different. Kumon (1997: 161) visited dozens of Japanese car and truck manufacturers in Asia and found that, in parts purchasing, they have a "high dependency on Japanese or Japanese-affiliated suppliers." Ueno reports that up to 70 percent of the "local" suppliers used by Japanese assemblers in the ASEAN-4 are, in reality, Japanese transplants.<sup>111</sup> And FIAS argues that Japanese automakers in that country deliberately avoid Thai suppliers: "One local producer claims he was excluded from the



OEM market by a Japanese assembler until he could prove, by using a Japanese testing company, that his components were of higher quality than those Japanese components being used by the assembler at that time.”<sup>112</sup>

Now let us consider progress (or lack of progress) toward the hiring of local management staff. Japanese MNCs must pay much higher salaries and benefits to their expatriate managers than to their local managers at overseas affiliates -- in some cases, as much as 10 times higher. Furthermore, they receive relentless criticism from host government officials for using Japanese rather than local staff at their operations in Asia. Given these two constraints, one would expect to find a steady reduction in the share of these expatriate managers.

But there has been no real progress on this front -- despite frequent promises by parent companies that they will “localize” (*genchika*) their Asian operations. Japanese expats held more than 13 percent of the management positions at Japanese manufacturing affiliates in the region in 1995 – a small decrease from 1989, when they held 15 percent of the positions.<sup>113</sup> This phenomenon is evident not only in wholly owned subsidiaries but also in joint ventures in which the Japanese partner owns less than 50 percent of the stock. “In places like Indonesia and the Philippines, where we do not have a majority of the equity,” says Akira Yokoi, vice-president for international affairs at Toyota, “we are still able to aggressively send in our own management team and maintain control.”<sup>114</sup> Even in those rare instances in which an Asian manager ends up in charge of production, finance or some other important division in a Japanese subsidiary or joint venture, he often is paired with an expatriate manager, who serves as a “big brother” or adviser.<sup>115</sup>

The net result is that regionalization has not led to a serious “hollowing out” of the Japanese economy. Manufacturing continues to account for nearly one-quarter of nominal GDP in Japan -- a higher share than in almost all other mature or “post-industrial” economies, including the United Kingdom (21 percent), France (18 percent) and the United States (17 percent).<sup>116</sup> By expanding into Asia with the help of existing relational ties, Japanese MNCs have reduced both production costs and job losses at home. And they have limited technology “leakage” to potential rivals in Asia.

Indeed, it is instructive to note that, in 1995, intra-firm technology licensing (from parent to affiliate) began to account for more than half of the total technology exports from Japan to Asia.<sup>117</sup> Although intra-*network* exports are not counted, and thus defy quantification, one can surmise that such exports account for much of the remainder. This means, then, that Japanese technology licensing to Asia is rarely conducted in the “unrelational” spot market.

## 6. The Costs of Continuity

If its manufacturing base is not “hollowing out,” and its technological resources are not “leaking” out, then Japan must be benefiting from the preservation -- via regionalization --

of its existing techno-industrial regime, right? Wrong. As discussed earlier, the costs of strong ties begin to outweigh the benefits in a developed or “mature” economy like Japan. This is because firms no longer can simply adopt existing technology and transfer it to related firms; they now must pursue radical innovation. That is, they must acquire and develop new ideas, new information in an environment of technological uncertainty. But firms in a highly relational regime are handicapped in such an environment; they are bound together by strong ties and thus less receptive to market signals and creative inputs that could contribute to technical breakthroughs or radical innovation.

Japan sits today on the cutting edge of the global technology frontier. It is a fully developed economy whose manufacturing firms, to compete, must develop new technologies and introduce new products. But because these firms commit themselves to long-term, reciprocal relationships, they often cannot freely take such bold steps. Relationalism, which in the past had yielded net gains through lower transaction costs, now generates net losses through higher opportunity costs.

A cursory glance at R&D data suggests that Japan is holding its own as a technological powerhouse in the global economy. Indeed, it spent 3.06 percent of its GDP on research and development in 1998 – more than the U.S. (2.59 percent), and other industrialized economies. And this represented an increase from 1990, when Japan’s R&D/GDP ratio was 2.85 percent.<sup>118</sup> But this statistic obscures the fact that Japan is lagging further and further behind in basic research – precisely the area where it most needs to focus.<sup>119</sup>

In the mid-1980s, the public and private sectors in Japan spent about 13 percent of their R&D budgets on basic research – about the same as in the U.S, but lower than in Germany and France (about 20 percent). In the late 1990s, the share of overall R&D expenditures allocated to basic research remained about the same in Japan, but increased in the U.S. (to about 16 percent) as well as in Germany and France (to about 22 percent).<sup>120</sup>

Japan’s performance in this critical area would have fallen even further behind had it not been for a massive and steady increase in government spending under the 1996 Science and Technology Basic Plan.<sup>121</sup> Japanese producers have slashed basic research expenditures, choosing instead to dedicate resources to the development of new applications with old technologies. In one survey, the Society for the Promotion of Machine Industries found that most Japanese firms were content to continue utilizing existing know-how. Fewer than 27 percent of firms were planning to innovate.<sup>122</sup>

R&D “intensity” (research and development expenditures as a percentage of total sales) actually *declined* in the manufacturing sector during the late 1980s and early 1990s, according to Watanabe and Hemmert.<sup>123</sup> At the same time, they note, R&D’s share in total manufacturing investment fell from 13.2 percent in 1987 to 8.9 percent in 1994. The two researchers trace this slowdown in R&D activity to the heady bubble years, when manufacturers focused on expanding production capacity – in Japan as well as overseas – rather than innovating. In the 1990s, then, firms had to try to compete without the benefit

of innovations that could or should have been made in the late 1980s. "In other words," Watanabe and Hemmert assert, "the long-lasting virtuous circle between capital investment and technological advance appears to be on the verge of collapse."<sup>124</sup>

Although some have suggested that Japanese academics are beginning to collaborate regularly with manufacturers on basic research (or at least on the publication of technical papers<sup>125</sup>), the results continue to disappoint. Japan has more than twice as many scientists and engineers as Germany, and nearly four times the number in France, but the productivity of their research is quite low. Boyer has shown that Japan in the mid-1990s produced half as many research articles -- on a per capita basis -- as Germany, and only about one third as many as France.<sup>126</sup> And the research environment does not seem to be improving. Since 1985, the number of scientists and engineers leaving Japan to pursue research elsewhere has exceeded the number of scientists and engineers coming to Japan. And the gap is growing wider each year; in 1995, the "brain drain" was equivalent to a net loss of 110,000 people.<sup>127</sup>

For Japanese firms, the bottom line here is reduced competitiveness.<sup>128</sup> In the first half of the 1990s, value added by manufacturers of general machinery and precision instruments fell 20 percent; value added by manufacturers of transportation equipment fell 13 percent.<sup>129</sup> Of the four major machinery industries, only electronics managed to achieve growth. But this was due primarily to a temporary surge in domestic demand for computer and telecommunication equipment in the early 1990s; indeed, the industry's fortunes quickly soured in the second half of the 1990s as demand collapsed. Profits in these machinery industries plummeted nearly 60 percent in the first half of the decade, then recovered a little in 1996 -- only to fall sharply again.

For Japan as a whole, this means sluggish economic growth today and into the near future as Japanese firms move too slowly to upgrade their technological capabilities. From 1991 through 1999, Japan's economy managed to grow (on average) by only 1.3 percent a year -- less than any other industrialized economy in the world. And at the end of what has come to be called the "lost decade" of the 1990s, it just barely avoided the dubious distinction of being the only economy since the global depression of the 1930s to experience three consecutive years of contraction.

The Japan Center for Economic Research expects the pain to get worse before it gets better; it estimates that the Japanese economy will barely hold its own until 2005, then slow by an average rate of 0.1 percent a year until 2015, and slow even more (0.2 percent a year) until 2025.<sup>130</sup> Exports, which had provided a welcome boost at various times in the past, no longer can do the trick. Japanese exports, as it turns out, are heavily concentrated in sectors with low growth intensity; Legewie reports that, in 1992, only 5 percent of those exports belonged to product groups that had enjoyed high performance.<sup>131</sup> Rather than exports, it was extraordinary government spending on public works -- enough to push the budget deficit up to 9.4 percent of GDP in fiscal year 2000 -- that kept the economy from collapsing in the 1990s.

In the race to develop state-of-the-art technology, how did Japan, which only a decade earlier looked like a sure winner, manage to fall behind? Some blame the Japanese system of higher education, which they say fails to promote independent scholarly research at a sufficiently advanced level.<sup>132</sup> Others, including the Japanese government, blame Japanese culture in general, saying it is conformist and thus stifles creativity.<sup>133</sup> But these explanations fall short because they cannot tell us why success in Japan's case so quickly turned to failure. The answer has more to do with the institutions -- or, more specifically, the network structures -- that make up relationalism in Japan.

State-industry cooperation, which worked so well when public and private technocrats could see the technological road ahead, now impedes the important signaling function of the market, which provides "bottom-up" information on consumer needs and wants to producers. Inter-firm linkages, while facilitating the diffusion of already developed technology through established networks, nonetheless limit opportunities for acquiring new ideas for product, process, and organizational innovation. At the same time, intra-firm linkages between labor and management, which had promoted teamwork and thus served to protect the firm's investment in human capital, now inhibit risk-taking in an environment of technological uncertainty.

In the aggregate, these relational ties form a national system of innovation that is ill equipped to cope with such uncertainty. This system is founded on what Rtischev and Cole call "organizational continuity;" that is, it works well when the status quo is stable, but "less well when there are fundamental and frequent changes in industry standards and dominant designs."<sup>134</sup> Okimoto and Nishi make virtually the same argument. Japan's system of innovation, they argue,

Is not designed to encourage bold new conceptualizing, radical departures from the prevailing orthodoxy, and freewheeling exploration of territories unmapped by known theories. Instead, Japanese organization is geared to operate on the basis of caution, conservatism, and incremental change. It filters out bold new ideas if those ideas cannot be readily proved. It can be accommodating in such areas as hardware, because hardware is predictable and susceptible to design proof; but radical, new concepts seldom pass through the intricate mechanism of consensual deliberation.<sup>135</sup>

A growing body of literature suggests that, for many countries, small and medium-sized enterprises (SMEs) represent a vital source of new technology, especially "breakthrough" innovations.<sup>136</sup> In the U.S., for example, Okimoto and Saxonhouse found that SMEs produce a relatively large number of patents with a relatively small amount of investment in R&D; in Japan, however, they found that SMEs are not as productive in generating new technology. Of 34 major technological innovations achieved over a 20-year period in postwar Japan, SMEs accounted for only two.<sup>137</sup> This finding is confirmed by the Small

and Medium Enterprise Agency, which reports that 70.6 percent of manufacturing subcontractors in Japan have never filed a patent. It concludes that “technical development activity in the small manufacturing sector has fallen to a low ebb.”<sup>138</sup>

In the 1950s and 1960s, Japanese SMEs tended to depend heavily on large firms for technology, as well as capital and markets. In spite of this, some -- even many -- prospered, growing into large, independent, innovative firms with names like Canon and Kyocera. But nowadays, when the economy has matured and growth has slowed overall, powerful upstarts like these are few and far between. If anything, small manufacturing firms in Japan today are more likely to *shrink* than to grow in size.<sup>139</sup> Kiyonari Tadao, the president of Hosei University, notes that “microenterprises” (tiny start-up ventures) are popping up virtually everywhere in the industrialized world -- with the exception of Japan, “where such small businesses are rapidly declining in number.”<sup>140</sup>

Figure 3 tells this story: The rate at which Japanese entrepreneurs launch new firms has fallen sharply since the early 1970s, when 7 percent of all firms were start-ups. In the early 1990s, the start-up rate fell below the closure rate for the first time in the postwar period; this means, of course, that Japanese firms are unable to hold their own and are, in the aggregate, declining in number. Today, the start-up rate is less than 4 percent (and even lower for manufacturing) -- well below the U.S. start-up rate of about 14 percent.

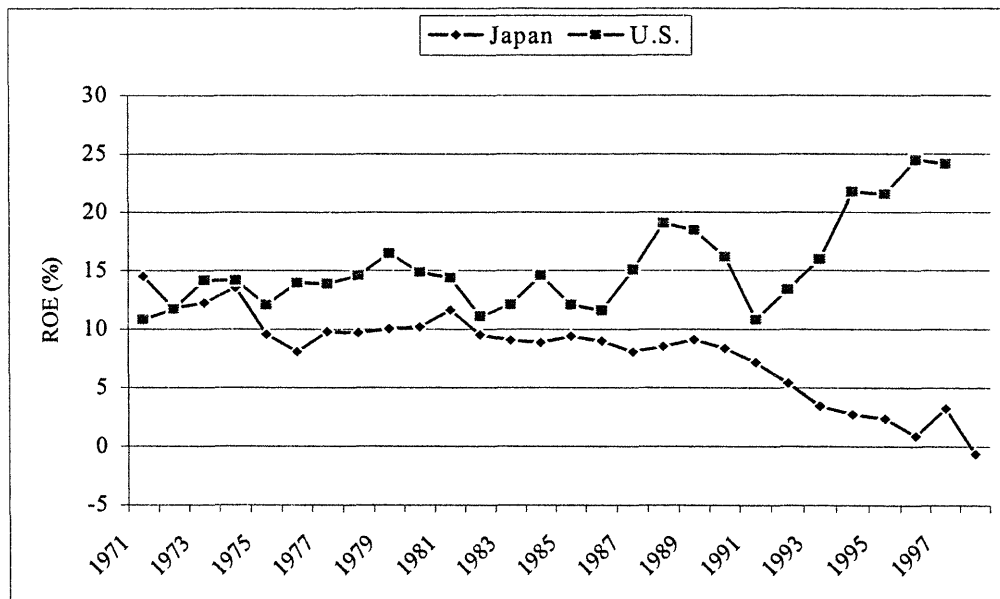
Contrary to journalist accounts, Japan has not yet spawned a “venture vanguard” of young, restless, highly educated, and computer-savvy entrepreneurs like the dot.com generation in the United States.<sup>141</sup> According to the Japanese government’s Research Group on New Business Creation, which conducted a survey of more than 1,000 microenterprises identified in 1998 by the *Nihon Keizai Shinbun* as new, fast-paced, and innovating, the typical venture businessman in Japan is 55; does not have a technical background in science or engineering (64 percent of the presidents of these venture firms did not); and, in a surprising number of cases (36 percent), may not even have graduated from a four-year college.<sup>142</sup> Only 12.5 percent of these firms are involved in information technology.<sup>143</sup>

A legacy of relationalism, these new start-ups increasingly tend to be affiliated in some way with a large firm. Figure 4 documents this ongoing trend. Among start-ups created since 1991, only 8.7 percent can be classified as truly independent (by contrast, nearly half of the start-ups founded in the early 1950s were independent). All of the other firms created in the 1990s are tied to a parent firm: 46.7 percent can be classified as “spin-offs” (in which an employee retires from an existing firm to start his own); 20.1 percent are “affiliates” (or, in Japanese, “*norenwake*,” a pattern in which an employee retires from a firm but intends to maintain a business relationship with his former employer); and 24.5 percent are “directed affiliates” (or, in Japanese, *bunsha*, a pattern in which an employee sets up a new firm under the direction of his old employer).

With this in mind, one can safely conclude that relationalism is imposing heavy costs on the Japanese economy, an economy in which potential entrepreneurs struggle just to line up qualified suppliers and talented managers. And regionalization is merely preserving the status quo.

**Figure 1**

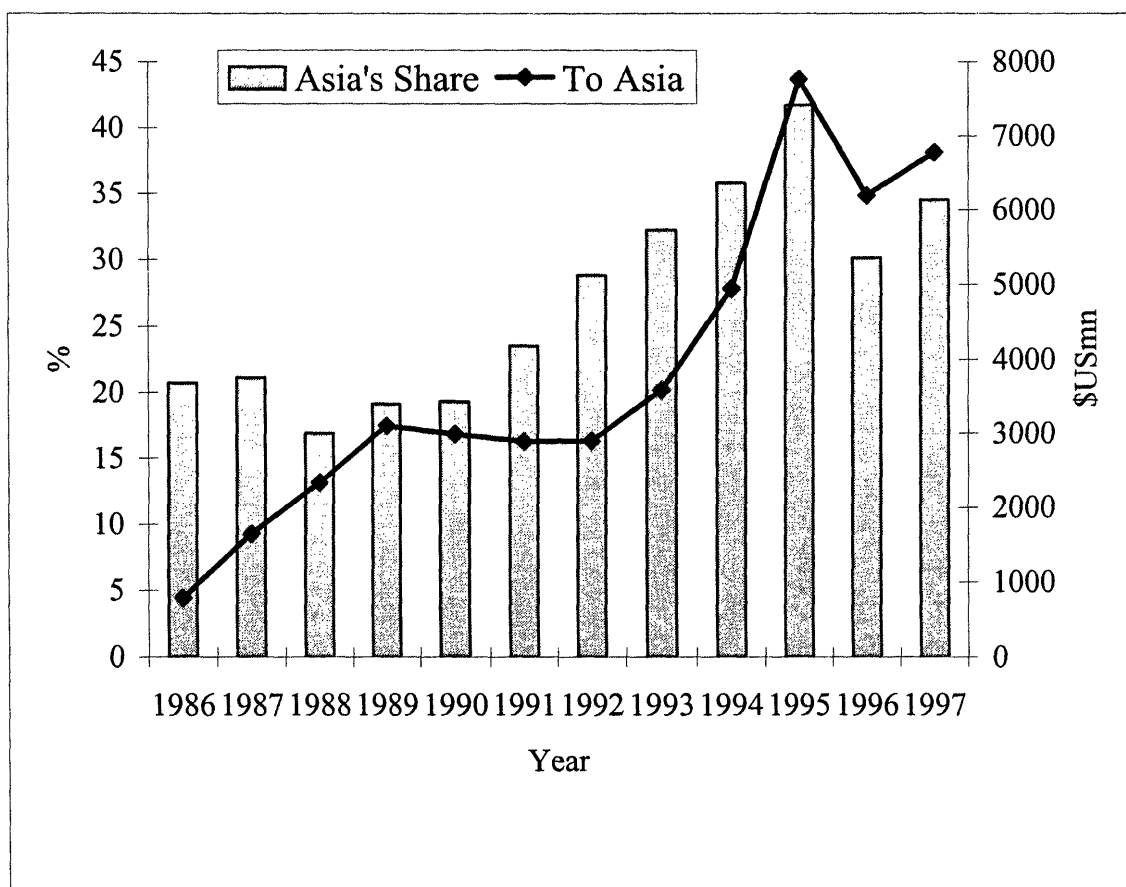
**Diverging Gains: Profit Rates for Large Firms in Japan and the U.S.**



Source: Nomura Research Institute (1999), "Nomura 400," Tokyo, and Standard & Poor's Corporation (1998), "Standard & Poor's Analyst's Handbook," New York.  
Note: The U.S. Data is return on book value for the "Industrials" in the S&P 500; the Japanese data is return on equity for Nomura's top 400 firms.

Figure 2

Japanese Manufacturing FDI to Asia  
(\$USmn, percent of total)

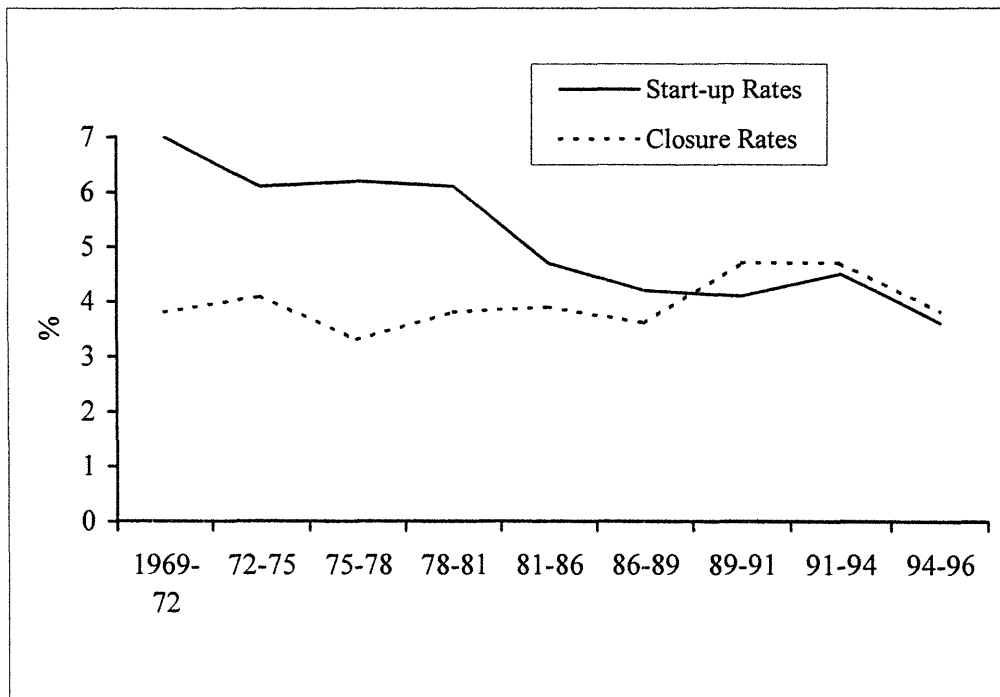


Source: Calculated by the author from Ministry of Finance, *Kokusai Kinyûkyoku Nenpô*, various years



**Figure 3**

**Business Start-up and Closure Rates**

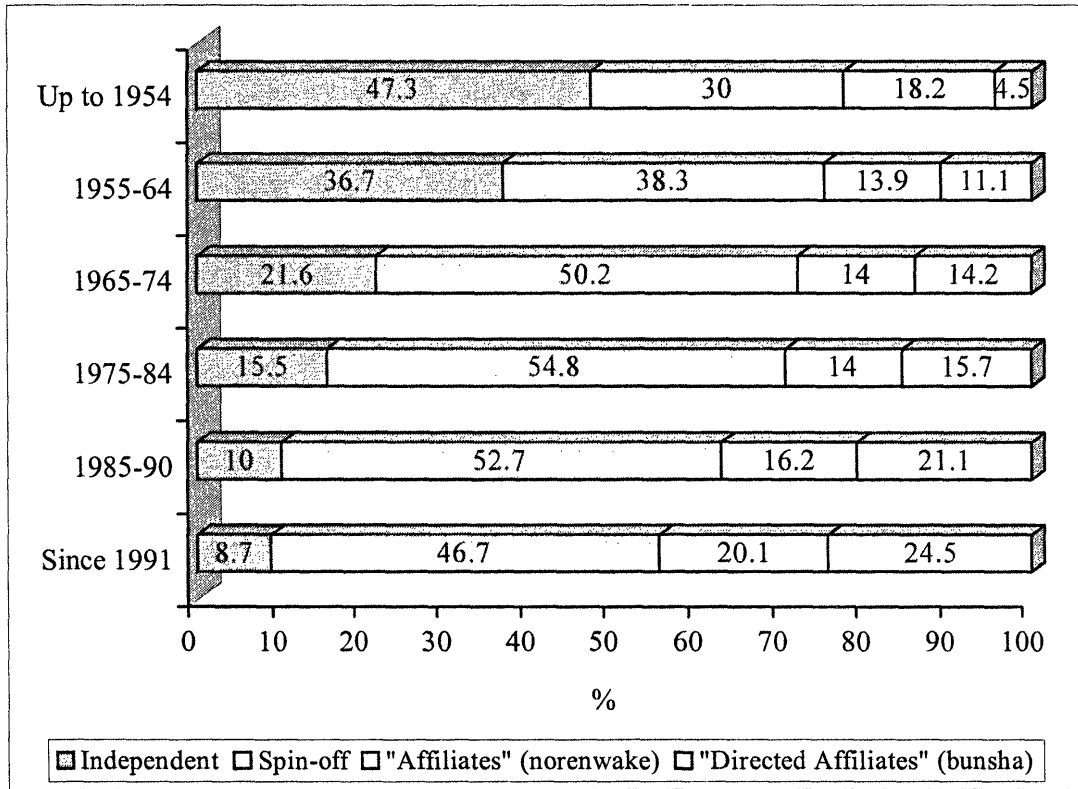


Source: SME Agency, *Chûshô Kigyô Hakusho*, 1998, p.306.

Note: All industries, yearly average.

**Figure 4**

**Character of Start-ups in Different Periods**



Source: SME Agency, *Chúshô Kigyô Hakusho*, 1997, p.320.

Note: Like *keiretsu* subcontractors, "affiliates" and "directed affiliates" are not formally or legally members of the parent firm's corporate group.

**Table 1**  
**Flow of JICA Experts to Asia**

Year	Number of Experts Dispatched to Asia	Share of Total Number of Experts
1991	1,292	50.3
1992	1,354	49.7
1993	1,513	51.9
1994	1,583	52.9
1995	1,565	51.4
1996	1,804	59.0

Source: MOFA, *Wagakuni no Seifu Kaihatsu Enjo no Jisshi Joukyou*, various years.

**Table 2**  
**Japan's Technology Exports to Asia**

<b>Year</b>	<b>Volume (US \$ bill)</b>	<b>Share of Japan's Total Tech Exports (%)</b>
1986	0.69	39
1987	0.69	40
1988	0.81	41
1989	1.03	39
1990	1.23	45
1991	1.36	46
1992	1.33	44
1993	1.49	47
1994	1.71	46
1995	2.25	50
1996	2.75	49

Note: Dollar amounts are based on a constant exchange rate of Y125 = \$1.

Source: Kagaku Gijutsuchō, *Kagaku Gijutsu no Shinkō ni kansuru Nenpō Hōkoku* (Annual Report on the Promotion of Science and Technology).

**Table 3**  
**Export-Import Bank Loans for JFDI to Asia**

<i>Year of Commitment</i>	<i>Overseas Investment Loans to Asia (bill Y)</i>	<i>Share of Total Commitments (%)</i>
1996	330.6	22.3
1995	251.2	15.3
1994	188.5	10.9
1993	163.7	13.1
1992	319.3	16.7
1991	188.7	12.7
1990	199.7	12.6
1989	135.7	8.0
1988	42.0	2.9
1987	198.7	14.1
1986	11.9	1.1
1985	41.3	4.7
1984	52.4	6.7
1983	77.0	8.0
1982	n/a	n/a
1981	90.2	5.6
1980	79.1	8.5

Source: Export-Import Bank of Japan, Annual Report (various years)

**Table 4**  
**Japanese Subcontractors Moving into Asia**  
 (% indicating they invested to "supply parts to an assembly manufacturer")

	1991	1992	1993	1994	1995	1996
NIEs	2.3	0.0	3.8	10.7	23.5	13.8
ASEAN-4	6.1	8.2	17.1	17.4	32.5	24.1
China	0.0	3.4	12.2	10.2	21.3	12.8

Source: annual surveys, Research Institute on Overseas Investment (Export-Import Bank of Japan)

Note: The institute asked respondents each year to identify the motivation behind their decision to invest in a particular foreign location. Multiple responses were allowed

**Table 5**  
**Japanese Expatriates in Private Firms in Asia**

Year of Data	Japanese Employees in Asia (Total Number)	Percent of All Japanese Employees Overseas	Percent Change (Year on Year)
1996	103,688	35.7	+ 9.6
1995	94,589	34.4	+ 13.3
1994	83,474	31.7	+ 7.4
1993	77,708	28.5	+ 8.5
1992	71,608	26.4	+ 10.2
1991	64,990	24.5	+ 16.9
1990	55,590	23.1	+ 10.8
1989	50,177	22.9	+ 9.7
1988	45,750	23.5	+ 8.1
1987	42,305	24.1	

Source: Ministry of Foreign Affairs, *Kaigai Zairyū Hōjinsū Chōsa Tōkei* (various years)

## Footnotes

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- <sup>1</sup> I am indebted to Richard Samuels for helpful comments on an earlier draft of this chapter.
- <sup>2</sup> These statistics, which come from the Management and Coordination Agency and Tôyô Keizai Shimpôsha, respectively, are presented in more detail in Walter Hatch, "Rearguard Regionalization: Protecting Core Networks in Japan's Political Economy," a PhD dissertation, University of Washington, 2000.
- <sup>3</sup> See Odagiri Naoto, "Kin'yû Fuan no Naka de no Senshutsu Mitsui Sumitomo ga Ippô Reedo" (In the Midst of Financial Crisis, Mitsui and Sumitomo are Moving Together to Lead the Pack), *Ekonomisuto*, April 17, 2001, pp. 26-35. Also see "Japan's Keiretsu: Regrouping," in *The Economist*, November 25, 2000, p. 74.
- <sup>4</sup> Toyo Keizai Shinpôsha, *Kaisha Shiki-hô* (Company Profiles, Vol. 3, summer 1999).
- <sup>5</sup> Ministry of Labor, *Rôdô Hakusho* (White Paper on Labor), 1998, p. 123.
- <sup>6</sup> Unless otherwise noted, "Asia" here means China, the four Asian NIEs (the Newly Industrializing Economies of South Korea, Taiwan, Singapore, and Hong Kong) and the ASEAN-4 (the four core members of the Association of Southeast Asian Nations: Thailand, Indonesia, Malaysia, and the Philippines).
- <sup>7</sup> I am influenced here by Pempel's use of the concept of "regime." See T.J. Pempel, *Regime Shift: Comparative Dynamics of the Japanese Political Economy* (Ithaca: Cornell University Press), 1998.
- <sup>8</sup> *Asahi Shinbun*, September 16, 1998.
- <sup>9</sup> *Japan Digest*, February 19, 1999, p. 5.
- <sup>10</sup> See Matsubara Satoru, "Yôyaku IT ni Torikumi Hajimeta Nihon Seifu" (The Japanese Government is Finally Beginning to Grapple with Information Technology), in *Ekonomisuto*, September 25, 2000, pp. 90-91. This is a special issue devoted to the "Nihon-gata IT Kakumei" (Japanese-style IT Revolution), and includes a 24-page section on each ministry's industrial policies to promote IT.
- <sup>11</sup> The survey was conducted by the Research Institute for the Advancement of Living Standards. Results have been published in Inagami Takeshi, ed., *Gendai Nihon no Kôporeito Gabanansu* (Corporate Governance in Contemporary Japan) (Tokyo: Tôyô Keizai Shimpôsha), 2000.
- <sup>12</sup> Dore, focusing more narrowly on interfirm ties, suggests that Japanese manufacturers operate on the basis of "relational contracting." See Ronald Dore, "Goodwill and the spirit of capitalism," in *Taking Japan Seriously* (Stanford University Press), 1987.
- <sup>13</sup> Economic Planning Agency of Japan, *Kôzô Kaikaku ni Chôsen: Keizai Shakai ni Dainamizumu o* (The Challenge of Structural Reform: Bringing Dynamism to the Economy), a report from the Keizai Shingikai (Deliberation Council on the Economy), June 1998, p. 23.
- <sup>14</sup> Sakakibara Eisuke, *Beyond Capitalism: The Japanese Model of Market Economics* (Lanham, Maryland: University Press of America), 1993.
- <sup>15</sup> Richard Samuels, *Rich Nation, Strong Army: National Security and the Technological Transformation of Japan* (Ithaca: Cornell University Press), 1994.
- <sup>16</sup> See Albert O. Hirschman, *The Strategy of Economic Development*. New Haven: Yale University Press, 1958; and Murakami Yasusuke, *Han-koten no Seiji-keizaigaku* (An Anti-Classical Political-Economic Analysis). Tokyo: Chûôkôron-sha, 1992. The latter was translated into English and published in 1996 by Stanford University Press under the title, *An Anti-Classical Political-Economic Analysis: A Vision for the Next Century*.
- <sup>17</sup> Data on intra-firm technology exports are included in an annual report (*Nihon no Gijutsu Yushutsu no Jittai* [Japan's Technology Exports]), published by NISTEP (National Institute of Science and Technology Policy). For more on this, see Walter Hatch, "Grounding Asia's Flying Geese: The Costs of Depending Heavily on Japanese Technology," *NBR Briefing* (No. 3), April 1998..
- <sup>18</sup> This remains largely true despite valiant efforts by "new growth theorists" such as Romer (1986) and Lucas (1988). New growth theory has sought to endogenize the variable of technological change. Unfortunately, however, this approach is still not very useful in that it is highly abstract and comes with a number of strong assumptions designed to improve its mathematical tractability.
- <sup>19</sup> In neoclassical economic theory, the market autonomously and automatically reallocates surplus factors of



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production to their highest and best use. In reality, though, physical and human capital represent sunk costs that are not so easily reallocated.

<sup>20</sup> State-industry cooperation, as neoclassical economists note correctly, often leads to rent-seeking activities. But this is not a pre-determined outcome; when state officials are motivated by a sense of national urgency or crisis, they are likely to refrain from paying rents.

<sup>21</sup> Imai Ken'ichi and Akiko Yamazaki, "Dynamics of the Japanese Industrial System from a Schumpeterian Perspective," SJC-R Working Papers Series No. 3, July 1992, Stanford Japan Center, p. 43.

<sup>22</sup> In his now famous growth model, Solow identified a residual that is unexplained by increases in labor and capital inputs. This residual is often regarded as a proxy for TFP.

<sup>23</sup> Gavin Cameron, "Catch-up and Leapfrog between the USA and Japan," an unpublished paper for Nuttfield College, Oxford University, May 1997. Cameron's estimates confirm those found in Kuroda Masahiro, "International Competitiveness and Japanese Industries, 1960-1985," in Wagner and van Ark, eds., *International Productivity Differences: Measurement and Explanations*. Amsterdam: North-Holland, 1996.

<sup>24</sup> Paul Krugman made this point in a controversial piece ("The Myth of Asia's Miracle") he wrote for *Foreign Affairs*, November/December 1994.

<sup>25</sup> In general, firms in an economy that has achieved technological catch-up can expect some decrease in their marginal productivity of capital. But this decrease was exceptionally dramatic in Japan's case. Data on returns to capital come from Robert Summers and Alan Heston's Penn World Tables, National Bureau of Economic Research, 1995, and are reported in Richard Katz, *Japan, The System that Soured: The Rise and the Fall of the Japanese Economic Miracle* (M.E. Sharpe), 1998, p. 66-71.

<sup>26</sup> Bundo Yamada and Kenji Okumura, "Information Technology, Globalization, and the Strategic Management of Technology," in Denis Fred Simon, ed., *Techno-Security in an Age of Globalization* (M.E. Sharpe), 1997, p. 114.

<sup>27</sup> One could attribute this, as institutionalists usually do, to inertia or "path dependence." Elsewhere, however, I suggest that Japanese elites wished to hang onto the positional power they enjoy by virtue of occupying central positions in relational networks. See Hatch (2000).

<sup>28</sup> Scott Callon, *Divided Sun: MITI and the Breakdown of Japanese High-Tech Industrial Policy, 1975-1993* (Stanford University Press), 1995, p. 148.

<sup>29</sup> Many studies have shown that Japanese firms fail to maximize profits, relative to their counterparts in the West, particularly the United States. For example, see Odagiri Hiroyuki, "Riekisei to Kyôsei" (Profitability and Competitiveness), in Imai Ken'ichi and Komiya Ryutarô, eds., *Nihon no Kigyô* (University of Tokyo Press), 1989. Fewer studies, however, have managed to demonstrate, once and for all, that this is due to the preferences of managers whose goal is expanding market share rather than raising the rate of return on investment. One exception is Kagano Tadao, Nonaka Ikujiro, Sakakibara Kiyonori, and Okuno Akihiro, *Nichibei Kigyô no Keiei Hikaku* (A Comparison of Management Practices in Japanese and American Firms) (Tokyo: Nihon Keizai Shinbunsha), 1983.

<sup>30</sup> Japan's manufacturing productivity actually decreased 0.1 percent a year, on average, between 1990 and 1994. By 1994, Japan's level of manufacturing productivity was second from the last in a ranking of 12 industrialized countries. Only South Korea was ranked lower. See Seisansei Kenkyûjo, "Nihon no Seisansei Nobiritsu Kaifuku mo Suru Izen 11-i" (Despite a recovery in its rate of productivity increase, Japan remains #11), *Seisansei Kenkyû*, Vol 23, October 1997, p. 4.

<sup>31</sup> Although the Clinton administration's approach was new, U.S. pressure on Japan had been building for some time. In September 1989, the two governments began negotiations on the "structures" of their respective economies. The U.S. pushed, for example, for stronger enforcement of Japan's Anti-Monopoly Act, and elimination of exclusionary keiretsu ties. For the most part, these negotiations were unsuccessful. See Leonard Schoppa, *Bargaining with Japan: What American Pressure Can and Cannot Do* (Columbia University Press), 1997.

<sup>32</sup> Itami Hiroyuki, "Atarashii Sangyô Dainamizumu (The New Industrial Dynamism), in *Asuteon*, no. 29 (summer), 1993, p. 93.

<sup>33</sup> Quoted in *Financial Times*, 21 December, 1992, p. 23.

<sup>34</sup> *Keidanren Review*, special issue, 1993, p. 8.

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<sup>35</sup> See JETRO, *Gyaku Yunyū no Jittai ni kansuru Ankeito Chōsa* (Survey Report on Reverse Imports) (Tokyo: Kaigai Keizai Jōhō Sentā), August 1998, p. 4.

<sup>36</sup> Even though MNCs engaging in such “intermediate forms” of FDI do not acquire a majority equity stake in an offshore business, they often gain *de facto* control over the business. This is why many economists treat them as variants of foreign direct investment.

<sup>37</sup> Urata writes that Japanese manufacturers are “breaking up the entire production process into several sub-processes and locating labor-intensive sub-processes in labor abundant Asian countries.” See Shujiro Urata, “Japanese Foreign Direct Investment in Asia: Its Impact on Export Expansion and Technology Acquisition of the Host Economies,” a paper prepared for the workshop on “Foreign Direct Investment, Technology Transfer, and Export-Oriented Development in Developing Countries,” in Maastricht, November 1996, p. 10.

<sup>38</sup> This comes from interviews with Sony officials in Tokyo (July 1992) and Penang (April 1993). See Walter Hatch and Kozo Yamamura, *Asia in Japan's Embrace: Building a Regional Production Alliance* (Cambridge University Press), 1996, p. 25.

<sup>39</sup> Hatch and Yamamura (1996: 26-27).

<sup>40</sup> *Nikkei Weekly*, April 7, 1997, p. 22.

<sup>41</sup> Tamura Ei, “Wagakuni Seizō Kigyō no Kaigai Tōshi no Genjō to Kōgo no Hōkō ni tsuite” (The Current State and Future Direction of Foreign Investment by Japanese Manufacturing Firms), *Chūshō Kōkō Geppō*, November 1996, p. 22.

<sup>42</sup> Paul N. Doremus, William W. Keller, Louis W. Pauly, and Simon Reich, *The Myth of the Global Corporation* (Princeton University Press), 1999.

<sup>43</sup> The state's ability to act as a “midwife” for industry is discussed in Evans (*Embedded Autonomy: States and Industrial Transformation*. Princeton University Press, 1995).

<sup>44</sup> The “flying geese” concept was first used by Kaname Akamatsu (“A Historical Pattern of Economic Growth in Developing Countries,” in *Developing Economies*, vol 1, 1962) to describe the process of technological assimilation that allowed a single industry in a developing economy to “graduate” from dependence on imports and eventually become a producer of internationally competitive exports. He was describing the turn-of-the-century textile industry in Japan. The concept was later used by Japanese economists such as Kiyoshi Kojima (*Direct Foreign Investment: A Japanese Model of Multi-national Business Operations*. London: Croom Helm, 1978) to describe the pattern of trade and investment within Asia that carried technology from mature to maturing economies. The concept was appropriated again in the 1980s by Japanese government officials, such as Okita Saburō (“Pacific Development and its Implications for the World Economy,” in James W. Morely, ed., *The Pacific Basin: New Challenges for the United States*. New York: The Academy of Political Science 1986), who used it to promote Japanese trade and investment in the region.

<sup>45</sup> The speech is reproduced in the *ASEAN Economic Bulletin*, vol. 8 (1991).

<sup>46</sup> MITI, *White Paper on International Trade*, 1992 (English version). Tokyo: JETRO, pp. 101-118. For more on the role of the Japanese state in this process, see Hatch and Yamamura (1996: 117-122, and 138-141), and Kit G. Machado, “Transnational Production, Regionalism, and National Development: The Case of the Japanese Motor Vehicle Industry in East Asia,” *Waseda Journal of Asian Studies*, Volume 17, 1995, pp. 35-6.

<sup>47</sup> See MITI, *Tsūshō Sangyō Seisaku no Jūten: Heisei 8 Nendo* (Commercial and industrial policy priorities for 1996), Tokyo, internal publication, 1995, p. 25.

<sup>48</sup> Interview, Koike Osamu, deputy representative, Japan Overseas Development Corporation, Bangkok, September 8, 1997.

<sup>49</sup> Suehiro Akira, ed. *Kuni jōhō: Tai* (Government Information: Thailand) (Tokyo: Nihon-Tai Kyōkai, March 1998), p. 160.

<sup>50</sup> *Nihon Keizai Shinbun*, November 11, 1998.

<sup>51</sup> *Yomiuri Shinbun*, March 2, 1997.

<sup>52</sup> Interviews with MITI officials, 1997-99.

<sup>53</sup> *Nikkan Kōgyō*, September 20, 1996.

<sup>54</sup> “MITI Urges Electronics Firms to Produce Abroad,” *Nikkei Weekly*, June 13 1992, p. 1.

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<sup>55</sup> In 1995, for the sake of comparison, I visited the service centers operated by the U.S. Department of Commerce in places like Bangkok, Taipei, Kuala Lumpur, and Jakarta. U.S. officials stationed there described themselves as “firemen” who move into action on behalf of American firms only after those firms run into trouble with host government officials and call for help. This retroactive role was confirmed when I asked for statistics on U.S. business activities in the region. Unlike Japanese officials, U.S. officials had collected only the most general data.

<sup>56</sup> “Ajia Shokoku ni Sangyô Ritchi Shidô” (Industrial Siting Guidance in Different Countries across Asia), *Nihon Keizai Shinbun*, September 20, 1990, p. 5.

<sup>57</sup> *Nikkan Kôgyô*, October 12, 1996.

<sup>58</sup> JETRO intervened on behalf of Japanese producers in Malaysia who complained when Sony lured skilled technicians to its new factory there by offering wages 30 percent higher than its competitors. See “Gathering of the Clan,” *Far Eastern Economic Review*, March 28, 1991, p. 52. Through interviews conducted in the mid-1990s, I learned that Japanese manufacturers have established similar wage cartels in industrial parks across Asia.

<sup>59</sup> For example, JETRO frets openly that competition between Japanese producers in Thailand is becoming “an extremely serious problem.” See JETRO, “Zai Tai Nikkei Seizôgyô Jittai Chôsa” (A Survey of Japanese Manufacturing Affiliates in Thailand), *Tsûshô Geppô*, June 9, 1997.

<sup>60</sup> The Japan Export-Import Bank (*Sanjûnen no Ayumi* (The Past Thirty Years), 1983, p. 40.

<sup>61</sup> FILP, which was tapped by the Japan Development Bank and other government-affiliated banks in the rapid growth period to finance loans to strategic industries, used to be known as Japan’s “second budget” (because it included so much money from postal savings) and Japan’s “hidden budget” (because it was beyond the deliberative reach of the Diet). The program, which now pays for special appropriations such as public works projects and ODA loans, is still well-endowed -- a function of the public’s growing concern over the solvency of private banks. In 1998, it was funded to the tune of 50 trillion yen. And the program remains firmly under the control of the Ministry of Finance, which merely reports income and expenses to the Diet.

<sup>62</sup> See Japan Machinery Exporters Association, “Wagakuni Kikai Sangyô no Ajia ni okeru Seisan Bungyô Jittai ni tsuite” (The Actual State of Production and Division of Labor by Japanese Machine Industries Operating in Asia), an unpublished report, June 1994. This was a survey of 144 Japanese machinery manufacturers with factories in China, the Asian NIEs, the ASEAN-4, and Vietnam.

<sup>63</sup> This is taken from Fourin, *Tônan Ajia-Taiwan-Taishû no jidôsha buhin sangyô* (The Automobile Parts Industry in Southeast Asia, Taiwan, and Oceania) (Nagoya: Fourin), 1998.

<sup>64</sup> See Japan Finance Corporation for Small Business, “Jidôsha, Kadenkigyô ni miru Shitauke Bungyô Kôzô no Henka: Kôzô Hendô ni Tsuyoi Shitauke Kigyô no Shutsugen,” *Chûshôkôko Repôto no. 97-2*, May 1997, p. 35. In 1994 and 1995, Asia received a smaller, but still substantial share (about 50 percent) of all of the overseas investment projects by Japanese auto parts producers. See Watanabe Machiko, “Jidôsha Sangyô” (The Automobile Industry) in *NIRA Seisaku Kenkyû*, Vol. 9 No. 10, 1996, p. 23.

<sup>65</sup> Small and Medium Enterprise (SME) Agency, *Chûshô Kigyô Hakusho, Heisei 10-nenban* (Small Business in Japan, 1998) (Tokyo: MOF Printing Bureau), 1998, p. 73.

<sup>66</sup> Interview, April 24, 1993, Shah Alam, Malaysia.

<sup>67</sup> Zenkoku Shitauke Kigyô Shinkô Kyôkai, *Shitauke Kigyô ni kansuru Q&A* (Questions and Answers about Being a Subcontractor), March 1997, p. 58.

<sup>68</sup> Adachi Fumihiko, “Kyûseichô suru Ajia to Nihon Chûshô Kigyô” (A Rapidly Growing Asia and Japanese Small and Medium Sized Firms) in Tatsumi Nobuharu and Sato Yoshio, eds., *Shin-chûshô kigyô-ron o Manabu* (Toward A New Analysis of Small and Medium Sized Firms) (Tokyo: Yuhikaku), 1996, p. 182. This term (*sendan-gata*) is also used to describe the way MOF traditionally has compelled stronger banks to work together to save failing institutions.

<sup>69</sup> In addition to this survey by the Export-Import Bank of Japan, one might also refer to Small and Medium Enterprise (SME) Agency, *Chûshô Kigyô Hakusho: Heisei 9-nenban* (Small business in Japan 1997) (Tokyo: MOF Printing Bureau), 1997, p. 204. The agency provides the results of its own survey of SMEs. The reason most often mentioned for investing in the ASEAN-4 was “to follow one’s parent firm, or main customer.”

<sup>70</sup> Rene Belderbos, Giovanni Capannelli and Kyoji Fukao, “Local Procurement by Japanese Electronics

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Firms in Asia,” an unpublished paper presented at a National Bureau of Economic Research seminar, June 1998, Osaka Japan, p. 12.

<sup>71</sup> Interviews and company data supplied to the author, 1997 and 1998.

<sup>72</sup> *Asahi Shinbun*, “Chûgoku de Toyota Seisan Byôyomi” (The Countdown for Toyota in China), January 28, 2000, p. 13. We should note here that the Chinese government, eager to receive investment in parts manufacturing, encouraged Toyota to replicate its keiretsu network in Tianjin.

<sup>73</sup> Among many possible examples, see Wendy Dobson, “Crossing Borders: Multinationals in East Asia,” in Wendy Dobson and Chia Siow Yue, ed., *Multinationals and East Asian Integration* (Ottawa: International Development Research Centre), 1997, p. 246.

<sup>74</sup> Interview, Bangkok, Thailand, September 2, 1997.

<sup>75</sup> In Hatch (2000), I test this hypothesis using an ordinary least squares regression analysis. Although the model explains only a fraction of the variation, it produces results that confirm this hypothesis.

<sup>76</sup> Interview, October 13, 1998, Tokyo.

<sup>77</sup> Interview, July 24, 1992, Tokyo.

<sup>78</sup> Interview, July 29-30, 1998, Hitachi-city.

<sup>79</sup> Ministry of Foreign Affairs, *Kaigai Zairyû Hôjinsu Chôsa Tôkei*, various years.

<sup>80</sup> Keisuke Nakamura and Padang Wicaksono, *Toyota in Indonesia: A Case Study on the Transfer of the TPS* (Jakarta: Center for Japanese Studies, University of Indonesia), 1999, p. 93. In interviews, host government officials often complained to me that training programs set up by Japanese manufacturers are nothing more than a way to supply their domestic factories with cheap labor from their Asian factories. And the Japanese government has all but acknowledged as much. In a 1999 report, the Justice Ministry alleged that some Japanese manufacturers force their Asian “trainees” to work extra hours without extra pay -- often on tasks that have nothing to do with their training program (*Daily Yomiuri*, August 11, 1999).

<sup>81</sup> “Manufacturers Shift Strategies in Asia,” *Nikkei Weekly*, July 15, 1997, p. 19. This motive also helps explain Japan’s relatively low level of “reverse imports” from manufacturing affiliates in Asia.

<sup>82</sup> Denki Rengo, *Nikkei Denki Kigyô no Kaigai Shinshutsu to Kokunai Sangyô/Koyô e no Eikyô* (Foreign Direct Investment by Japanese Electronics Firms and the Impact on Domestic Production and Employment). (Tokyo: Denki Sogo), June 1998 report, p. 169.

<sup>83</sup> “Japanese Companies Gave Most Aid to Thai Joint Ventures in Crisis,” *Nikkei Weekly*, June 14, 1999, p. 20. The *Far Eastern Economic Review* (July 29, 1999, p. 52) reported that the Japanese government -- through the Export-Import Bank -- helped finance a number of these capital injections.

<sup>84</sup> In Thailand, for example, the number of Japanese FDI projects increased from 158 in 1998 to 188 in 1999, according to the Thai Board of Investment. The number of U.S. and European projects, meanwhile, fell from 62 to 53, and from 123 to 83, respectively.

<sup>85</sup> *Asahi Shinbun*, April 14, 2000, p. 10.

<sup>86</sup> Emily Thornton, “Japan’s Asian Comeback,” in *Business Week*, November 1, 1999, p. 19.

<sup>87</sup> *Ibid.*, p. 18.

<sup>88</sup> See JETRO, *Tsûshô Guppô*, May 31, 1999, p. 10. Indeed, a large percentage of the Japanese manufacturing affiliates that injected capital into established operations in Asia, and thereby increased their equity position in those joint ventures, were parts producers. These included Showa and Keihin, Honda suppliers in Thailand, and Unisia Jecs, a Nissan supplier in South Korea. See *Nikkei Weekly*, June 15, 1998, p. 18.

<sup>89</sup> See *Nikkei Weekly*, October 19, 1998, p. 18; and Dec. 21, 1998.

<sup>90</sup> See *Nikkei Weekly*, May 11, 1998, p. 19.

<sup>91</sup> See *Nihon Keizai Shinbun*, February 5, 1998.

<sup>92</sup> See *Nikkei Sangyô Shinbun*, April 6, 1998.

<sup>93</sup> See *Nikkei Weekly*, October 5, 1998, p. 18. Aishin Seiki, one of Toyota’s most trusted suppliers in Japan, also got into the act by importing door locks from its affiliates in Thailand and Indonesia (*Nikkei Weekly*, October 26, 1998, p. 18). Asahi Glass did the same, importing auto glass for as many as 50,000 vehicles a year from its affiliate in Thailand (see *Nikkei Weekly*, January 11, 1999, p. 18).

<sup>94</sup> See *Nikkei Weekly*, September 21, 1998, p. 22.

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- <sup>95</sup> Interview, Tokyo, November 27, 1997.
- <sup>96</sup> Interview, Tokyo, July 23, 1999.
- <sup>97</sup> *OECD Newsletter*, No. 73, April/May 1999.
- <sup>98</sup> JICA handout, "Activities for ASEAN Financial Crisis in Fiscal 1998," undated.
- <sup>99</sup> Interview with Shukunobe Masami, July 23, 1999, Tokyo.
- <sup>100</sup> JICA handout, "JICA and Japan's Support to Cope with Asian Financial Crisis," 22 July, 1999.
- <sup>101</sup> Interview with Ishikawa Kokuo, senior assistant manager, international section, JFS, 5 July, 1999
- <sup>102</sup> *Nikkei Weekly*, March 9, 1998.
- <sup>103</sup> *Yomiuri Shinbun*, July 11, 1998.
- <sup>104</sup> OECD (Overseas Economic Cooperation Fund), "Q&A on Asian Economic Crisis Support." In *OECD Newsletter*, April-May, 1999, p. 7.
- <sup>105</sup> Interview, April 27, 1993, Singapore. Quoted in Hatch and Yamamura (1996: 19).
- <sup>106</sup> Richard Samuels, *Rich Nation, Strong Army: National Security and the Technological Transformation of Japan* (Ithaca: Cornell University Press), 1994.
- <sup>107</sup> Hiroyuki Itami, "Overview: The Structural Upgrading of East Asian Economies and Industrial Networks," in Institute of Developing Economies and JETRO, eds., *Can Asia Recover its Vitality? Globalization and the Roles of Japanese and U.S. Corporations* (Toyo: IDE), 1998, p. 21.
- <sup>108</sup> JETRO, *Shinshutsu Kigyô Jittai Chôsa: Ajia-hen* (A Survey of Investing Firms: Ajia Edition), (Tokyo: JETRO), 1999. In fact, JETRO does not actually "report" any such figure. But one can calculate it rather quickly by using the raw data for five different countries (Thailand, Malaysia, Singapore, Indonesia, and the Philippines) on five different pages (63, 108, 151, 198, 242).
- <sup>109</sup> Foreign Investment Advisory Service (FIAS), "Impediments to Backward Linkages and BUILD, Thailand's National Linkage Program," a report submitted to Thailand's Board of Investment, September 1991, p. 41.
- <sup>110</sup> Okamoto Yumiko, "Shuyô Sangyô no Taigai Chokusetsu Tôshi no Dôkô: Denshi/Denki Sangyô," in *NIRA Seisaku Kenkyû*, Vol. 9 No. 10, 1996, p. 20.
- <sup>111</sup> Ueno Kaori, "ASEAN Sangyô Kyôryoku Keikaku (AICO) to Nikkei Jidôsha Meikaa no Chinai Senryaku" (The ASEAN Industrial Cooperation [AICO] Scheme and the Regional Strategies of Japanese Automakers), in *Tokubetsu Keizai Chôsa Repôto: Heisei 8-nendo* (Tokyo: JETRO), 1997, pp. 27-38.
- <sup>112</sup> FIAS (1991), p. 62.
- <sup>113</sup> MITI, *Kaigai Jigyô Katsudô Kihon Chôsa* (Basic Survey on Overseas Business Activities), various years.
- <sup>114</sup> See *Asahi Shinbun*, "Ajia no Jidôsha Sangyô: Zadankai," November 27, 1996, p. 15.
- <sup>115</sup> Interviews, Bangkok, Beijing, Jakarta, Kuala Lumpur, Seoul, Singapore, Taipei, 1992-1997. See also Nakamura and Padang (1999: 22)
- <sup>116</sup> Germany is the exception. Like Japan, it retains a relatively broad manufacturing base in its domestic economy.
- <sup>117</sup> Data on intra-firm technology exports are summarized in an annual report (*Kagaku Gijutsu Kenkyû Chôsa* [Survey on R&D]), prepared and published by the former Sômu-chô. (Management and Coordination Agency). For more on this, see Walter Hatch, "Grounding Asia's Flying Geese: The Costs of Depending Heavily on Japanese Technology," *NBR Briefing* (No. 3), April 1998.
- <sup>118</sup> National Science Foundation, "National Patterns of R&D Resources," 2000, available on the web at <http://www.nsf.gov/sbe/srs/nsf01309/start.htm>
- <sup>119</sup> One should also note that this statistic is a ratio. The numerator is the value of R&D expenditures, which actually rose at a slightly faster clip in the U.S. than in Japan in the 1990s. And the denominator is the GDP, which hardly budged at all in Japan but climbed sharply in the U.S. Given this fact, we should not be surprised to see Japan's R&D/GDP ratio increase relative to the U.S. ratio.
- <sup>120</sup> Science and Technology Agency, *Kagaku Gijutsu Hakusho, Heisei 12-nen* (White Paper on Science and Technology), 2000, pp. 141-142.
- <sup>121</sup> See Hiroshi Inose, "Boosting the Basic," in *Look Japan*, March 1997, p. 22.
- <sup>122</sup> Society for the Promotion of Machine Industries (Kikai Shinkô Kyôkai), *Engineering Industries of Japan: Moving Toward New Operations, New Products*, no. 32, 1998, p. 10.

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<sup>123</sup> Chihiro Watanabe and Martin Hemmert, "The Interaction Between Technology and Economy: Has the 'Virtuous Cycle' of Japan's Technological Innovation System Collapsed?" in Martin Hemmert and Christian Oberlander, *Technology and Innovation in Japan: Policy and Management for the Twenty-first Century* (London: Routledge), 1998.

<sup>124</sup> Watanabe and Hemmert (1998), p. 53.

<sup>125</sup> Kenneth Pechter and Sumio Kakinuma, "Coauthorship Linkages between University Research and Japanese Industry," in Lewis M. Branscomb, Fumio Kodama, and Richard Florida, ed., *Industrializing Knowledge: University-Industry Linkages in Japan and the United States* (Cambridge, MA: MIT Press), 1999.

<sup>126</sup> Robert Boyer, "Will the Japanese and the German Innovation Systems Cope with the Challenges of the Twenty-first Century?" A paper presented to the Economic Research Center, Nagoya University, autumn 1998.

<sup>127</sup> See Science and Technology Agency, *Kagaku Gijutsu no Shinkô ni kansuru Nenji Hôkoku, Hensei 8 Nendo* (Annual Report on the Promotion of Science and Technology), 1996, pp. 61-2. Of the scientists and engineers leaving Japan, most are headed to the U.S. or Europe. And most of those coming to Japan hail from Asia.

<sup>128</sup> In a survey of 670 firms conducted by the Tokyo Chamber of Commerce, 65 percent said they thought Japanese manufacturing had lost some of its competitive edge in the 1990s. The chamber explained this pessimism by noting that, in the past, Japanese manufacturers had managed to climb out an economic hole by holding the line on wages for workers and parts prices for subcontractors. "But even though they have tried again to squeeze water from a virtually dry towel, manufacturers continue to face hard times." See Tokyo Chamber of Commerce, *Wagakuni Seizôgyô no Kyôsôryoku Saikyoku-ka ni Mukete* (Toward the Reinforcement of Competitiveness in Japanese Manufacturing), a report of a chamber committee on competitiveness, October 1996, p. 3.

<sup>129</sup> MITI, *Kôkôgyô Shisû Nenpô* (Annual Report on Manufacturing and Mining Indices), various years.

<sup>130</sup> See the JCER webpage at <http://www.jcer.or.jp/eng/eco-for/97long.htm>.

<sup>131</sup> Jochen Legewie, "Foreign Direct Investment, Trade, and Employment: The Role of Asia within the Discussion of Industrial Hollowing Out in Japan," working paper 97/1, Deutsches Institut für Japanstudien (DIJ), 1997, pp. 24-5.

<sup>132</sup> See, for example, Olaf Karthaus, "Polymer Education in Germany," *Kôbunshi* (54: 10), 1997. He laments the comparatively low quality of chemistry training in general, and polymer science in particular, in Japan.

<sup>133</sup> See the Ministry of Labor, *Chiteki Sôzôgata Rôdô to Jinji Kanri* (Knowledge-creating Work and Personnel Management) (Tokyo: Rôdô Daijin Kanbô), 1996, pp. 90-91. The ministry assails Japan's "risk-averse institutional culture."

<sup>134</sup> Dimitry Rtischev and Robert E. Cole, "The Role of Organizational Discontinuity in High Technology: Insights from a U.S.-Japan Comparison," a paper for a conference on "Business Venture Creation and New Human Resource Management in Japan, Europe and the U.S.A.," sponsored by Deutsches Institut für Japanstudien (DIJ), Tokyo, October 1998, p. 3.

<sup>135</sup> Daniel Okimoto and Yoshio Nishi, "R&D Organization in Japanese and American Semiconductor Firms," in Masahiko Aoki and Ronald Dore, eds., *The Japanese Firm: The Sources of Competitive Strength* (Oxford: Oxford University Press), 1996, p. 203.

<sup>136</sup> Bonin puts it this way: "When the process of innovation is broken down into phases, it appears that small firms have an advantage in the initial stages of invention, as well as an advantage for less expensive, but much more 'radical' inventions." See Bernard Bonin, "Oligopoly, Innovation, and Firm Competitiveness," in Jorge Nosi, ed., *Technology and National Competitiveness: Oligopoly, Technological Innovation, and International Competition* (Montreal: McGill-Queen's University Press), 1991, p. 276.

<sup>137</sup> Daniel I. Okimoto, and Gary Saxonhouse, "Technology and the Future of the Economy," in Kozo Yamamura and Yasukichi Yasuba, *The Political Economy of Japan: Volume 1, The Domestic Transformation*. Stanford: Stanford University Press, 1987, p. 399. For a very different view of SMEs and innovation in Japan, see David Friedman, *The Misunderstood Miracle: Industrial Development and Political Change in Japan* (Ithaca: Cornell University Press), 1988.

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<sup>138</sup> Small and Medium Enterprise Agency, *Chûshô Kigyô Hakusho, Heisei 8-nenban* (Small Business in Japan) (Tokyo: MOF Printing Bureau ) 1996.

<sup>139</sup> See Small and Medium Enterprise Agency (1996). In the 1988-90 period, 7 percent of SMEs shrank substantially in size (as measured by number of employees) and nearly 8 percent grew substantially. But in the 1991-93 period, almost 9 percent of SMEs shrank and only 6 percent grew.

<sup>140</sup> Tadao Kiyonari, "Japan's Small Businesses Need Bigger Hand," *Nikkei Weekly*, July 14, 1997.

<sup>141</sup> These journalist accounts include Peter Landers, "Venture Vanguard: Small firms aim to re-ignite Japan's entrepreneurial spirit," in *Far Eastern Economic Review*, July 31, 1997; and Kazunari Yokota, "Start-ups find ways to vault into mainstream economy," in *Nikkei Weekly*, November 8, 1999.

<sup>142</sup> Research Group on New Business Creation, *Nihon no Benchaakigyô to Kigyôsha ni kansuru Chôsa Kenkyû* (A Survey on Start-up Firms and their Founders in Japan), NISTEP Report No. 61, March 1999, National Institute of Science and Technology Policy. Respondents to this survey came from a directory of 2,400 venture firms listed in Nihon Keizai Shinbunsha, *1998-nenban Nikkei Benchaabijinesu Nenkan* (The 1998 Nikkei Venture Business Yearbook), which focuses on firms that: a) possess their own technology or know-how; b) have enjoyed high growth; and c) are relatively young.

<sup>143</sup> A different study by the Nikko Research Center found that eight of the top ten firms engaged in information processing and information services were established by large manufacturers of information hardware (such as Hitachi) or large users of information software (such as Nomura Securities). The two independent firms in this key industry were established in the 1960s. See Nikko Research Center, *Analysis of Japanese Industries for Investors* (Tokyo: Nikko Research Center), 1999, pp. 32-41.